STWE REVIEW

JANUARY 1960

Volume 7 Number 1

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SCHEMATISM — Robert L. Wallick

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A NOTE TO CONTRIBUTORS

Contributions to the *Review* are always welcome; short articles of 500 to 1000 words are most easily fitted into our small magazine.

Send the original on heavy white bond paper, typewritten, double or triple spaced, plus two carbons. Leave at least a 1-inch margin on all sides, number the pages consecutively, and be sure that all illustrations are keyed to the text.

Articles should not exceed 2500 words plus three illustrations.

We assume that every article is approved by your company before it is submitted. The authors' names and affiliations should be on the manuscript. A short biographical note is most helpful. This note should include the present title of the author, the full name of his organization, and complete information about books, other articles, or any other publication credits. Please address all contributions to the Editor; the Review Committee will read your article and our publication plans will depend on their collective judgment.

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REPRINTS

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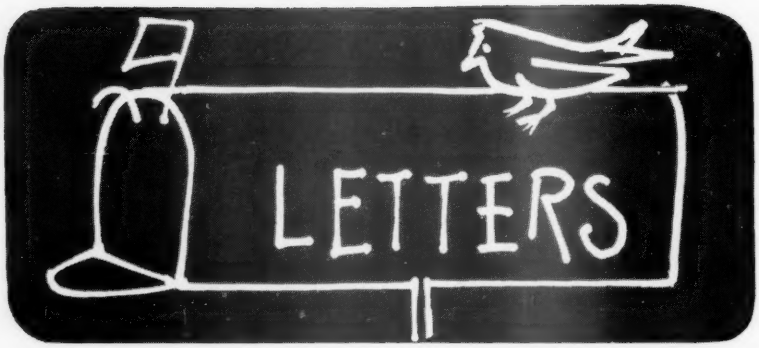

To Editor, *STWE Review:*

In the years immediately preceding the 1939-45 war, the production of technical literature in the U.K. was a mere trickle, compared with the large-scale output at the present day. The rapid advance of scientific and engineering knowledge during the war period, and the need subsequently to train and inform the suddenly expanded Armed Forces, demanded similar advances in the production of technical literature. From this the modern industry of technical publications progressed to its present state of highly organized production.

The greatest problem to be faced has always been the seemingly stubborn reluctance of Industry to recognize the practical necessity of good technical manuals which, in reality, are as important to the safe and efficient operation of the manufactured equipment as the most vital locking nut.

Nowadays most industrial concerns in the U.K. have either their own technical publications department, staffed with competent engineers and technicians who are also trained writers and illustrators, or use the services of the technical agencies. Often it is found that the industrial concern has, in addition, installed offset lithography and can handle the complete production of their handbooks including the binding.

During the 1920's a few far-sighted British engineers were beginning to organize, and give a great deal of thought to, the future role of specialist technical agencies. Most advertising agencies in this country handle technical accounts from the standpoint of general advertising and publicity, but there are very few who prepare complete maintenance and repair manuals and operation handbooks containing all the necessary detailed technical information. Those agencies that have organized their technical divisions in a similar way to the industrial technical publications departments provide a very excellent service, recognized by the Armed Services and Industry.

As in most trades and professions the skilled craftsman is at a premium, and the training and continued supply of such persons in our particular craft is no exception. So it was that, late in 1953, a group of people concerned in various ways with the preparation of technical publications met to discuss the problems. From this meeting arose the idea of an Association that would exist to "promote the advancement of technical publications techniques by the interchange of knowledge and information" and improve, thereby, the skill and status of technical writers and illustrators. Subsequently, in the spring of 1954, the Technical Publications Association was formed with a total membership only one quarter of the present active list.

In the early days a Newsletter was issued to members as frequently as possible to keep them up-to-date with Association news, but soon the regular journal was being published. In addition, lectures and meetings are held at which experts discuss aspects of publications work. The practical aspect of our work is not neglected, and visits are made to printers, process engravers, and other trades concerned with book production.

The controversial problem of recognized standards for drawing practice, spelling, etc., is being actively tackled by a special committee. Their findings are at present available as a guide for Association members only, but it is hoped they will eventually be considered in the committees of the British Standards Institute, of which the Association confidently expects soon to become a member.

The Association has, from the very beginning, campaigned for recognized standards of competency of technical writers and illustrators and, ultimately, in collaboration with the City and Guilds of London Institute, has established national examinations and certificates. The Association is represented on both the Advisory Committee of the Institute and on the panel of examiners who arranged

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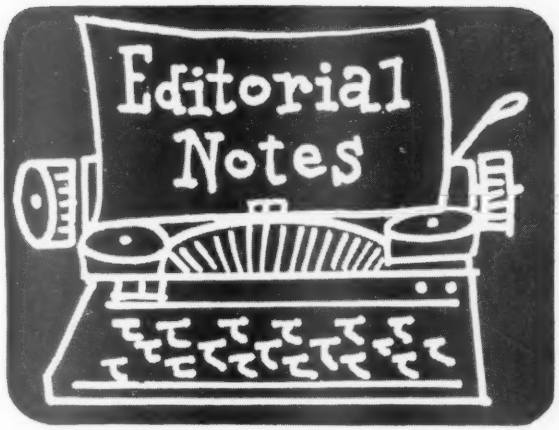


Most of us consider ourselves professionals. But such personal appraisals really mean nothing. We must attain professional stature in the eyes of the men who are recognized and respected members of the older professions. Just how do we go about the attainment of professionalism? Our guest editorial tells us.

It is written by H. C. McDaniel, Director of Technical Information, Westinghouse Electric Corporation, Pittsburgh. A senior member of STWE, McDaniel is well known for the prominent part he has played in the national affairs of the Society during the past several years.

YOU AND YOUR JOB

The most important problem facing the members of this Society today is achieving professional recognition. While much has been said on this subject, many questions about professionalism still remain unanswered. And surprisingly enough, many of these seem to be relatively simple questions.

For example, just what is professionalism in technical writing and how is it attained? Does being employed as a technical writer automatically make one a professional? If it doesn't, what are the other considerations?

One way to find the answers to these and related questions is to read everything available on the subject of professionalism. Ultimately, this provides answers to most of the questions since considerable published information on the subject exists today. For example, the Dictionary of Education contains an excellent definition of *profession*. As defined, *profession is an occupation involving relatively long and specialized preparation on the level of higher education and governed by a special code of ethics.*

This definition is particularly valuable for in it can be found the answer to that all too frequently asked question, "Just what is professionalism in technical writing and how is it attained?" If, as defined, a profession involves relatively long and specialized preparation on the level of higher education, then certainly *study and training* is one of the essential elements of a profession.

Further critical analysis of the definition reveals that *success* is another essential element, as is the *conduct* of the practitioners that in turn is guided by the code of ethics of the society. By isolating the three essential elements of the definition of profession, reading can be channeled into these areas.

Surprising agreement exists among authors on the "study and training" element. This is viewed generally as an extended period of mental application that is needed to acquire the factual and definitive knowledge so essential to logic and reason and to develop skill in application. While this is not the complete answer to "What is professionalism in technical writing?" it leads directly to the principal distinguishing characteristics of a profession, which are the possession of an extensive body of knowledge, plus a group of skills, and a set of attitudes which enable members to perform a particular type of service. Thus to attain professionalism we must possess knowledge, skill, and attitude.

DISTINGUISHING CHARACTERISTIC

While there is general agreement among authors that preparation for a profession involves the extended period of specialized study and training needed to acquire the factual and definitive knowledge so essential to logic and reason and to develop skill in their application, there is a rather wide divergence of opinion on that distinguishing characteristic of a profession—the possession of a particular body of knowledge. Some authors claim that we have the necessary body of knowledge directly related to technical writing, and cite as proof of their claim the fact that colleges and universities are offering degree-granting courses in technical communication.

Other authors claim we do not have the necessary body of knowledge. They aver that a body of knowledge must be a content of its own rather than a content of other disciplines. They then point out that, to a large extent, technical writing has borrowed its knowledge wholesale from related areas. This may be so. However, this postulation can be put to a couple of simple tests to see if it stands up.

The first question is: What do technical writers do? In general, they write about technology. Though informal, this definition is adequate because it can be understood. But perhaps a more formal definition is needed. Fortunately, a good one can be found in Joseph N. Ulman's book *Technical Reporting*. He says, "Technical writing is a specialized branch of the field of communications. Its purpose is to convey technical information and ideas accurately and efficiently to a specific audience."

(*Continued on Page 33*)

The Future of the STWE Review

Frank R. Smith

A few months ago Allan Lytel asked me to work with the other members of the Editorial Board of the *Review* in a reexamination of the editorial policies which he and Tom Grogan had stated in the first issue of the *Review,* back in January 1958. More specifically, Mr. Lytel asked for suggestions about what kinds of articles should be published and for the names of potential contributors of eminence and authority. He felt that having established a definite format and a regular publication schedule for the journal—having, in other words, gotten the magazine off the ground and flying—he should make certain of the course to be followed and the types and sources of the cargo to be carried during the journey through the next five or ten years.

The Editorial Board considered these three problems separately: the statement of a basic long-range editorial policy; the statement of specific suggestions about kinds of articles to be published and departments to be established; and the statement of potential sources of high caliber, professional articles. We have, we think, arrived at a solution to the first part of the problem—the general editorial policy, which is printed on the next page. But we have not satisfactorily solved the second and third parts of the problem. Oh, yes, we made suggestions; individually, each of us could think of one or two kinds of articles and one or two people or agencies who might write them. But that's not much ammunition to turn over to the man who is expected to produce an issue full of stimulating, valuable, professional articles four times every year, year after year.

We decided that we are too small a segment of the membership to enable us to represent with authority the widely divergent interests of the group. Obviously, our profession embraces many different specialized aspects of technical communications—the STWE application blank lists some ten kinds of basic jobs, most of which must have several subdivisions and all of which will vary to some extent from one company or agency to another. How is the *Review* Editor—how is the Editorial Board of five—to know what kinds of questions, policies, procedures, techniques, and publications in all these specialized jobs need competent discussion?

The only people qualified to answer this question are the specialists themselves. The only people qualified to evaluate the competence of a potential author on a specialized subject are his peers. And yet it is precisely this kind of article which the *Review* must publish if it is to establish its professional reputation—the expert, specialized, detailed discussion that distinguishes the professional paper from the general-interest one.

All this might justifiably be considered begging the question. We have not answered the questions Allan asked us—we have merely passed them on to you. We have said that we are not in a position to speak for you, to tell Allan that you as an individual would like to see in the *Review* an article by J. Doakes describing how he showed graphically the simultaneous effect of three variables upon the independent variable. We cannot tell him that you as an individual would like to have on hand, for the benefit of new workers, a concise, accurate description of . . . (*You* fill it in.) The point is that only *you* can say specifically what you would like to see, what you would keep and refer to in the future. If you want a journal that speaks *for* and *to* you, you must get into the communications act. You've got to make your voice heard in the editorial offices and quite possibly in the pages of the journal itself.

The editor of any publication depends upon "feedback" from his readers to gauge the effectiveness with which he is meeting their needs, but the editor of a new publication like ours, lacking the backlog of years and a clearly defined, consistent editorial policy polished by long use, is absolutely lost without reader response.

Furthermore, because our profession is relatively new and because there has been no significant national journal in our field until now, there are few or no nationally known authorities with established reputations. Those of you who have grown up with the profession are the authorities. *You* must lay the foundation of our literature.

This, then, is a plea to you to do your part as active, interested members of STWE, to help Allan Lytel and his staff in the job of publishing *your* journal. Write him and suggest at least one specific subject you think would make a good *Review* article and tell him who can write it. You might even throw modesty overboard and volunteer to write it yourself. Ω

Editorial Policy
STWE Review

FUNCTION, OBJECTIVE, SCOPE

The **function** of the *STWE Review* is to provide a medium for the publication of information relevant to the professional interests of the members of STWE.

The **objective** of the *STWE Review* is to contribute to the professional advancement and recognition of STWE members: to seek out and publish information which helps its readers to do their jobs better, information which broadens their knowledge (and others') of their profession, information about what is fundamental in the communication process as well as information about the most sophisticated applications of the fundamentals. In doing all this the objective is also to begin building the nucleus of that body of integrated, systematized knowledge which is the heritage of a true profession, passed down from initiate to novice, teacher to student, generation to generation . . . always being refined and revised and replenished.

The **scope** of the *STWE Review* is, of course, defined by its function and objective. It must, therefore, be broad enough to include the occupational interests of all the STWE members, ranging from top managers and college professors through all levels and kinds of practitioners. It must include not only our own fundamental research but the pertinent findings of related research: for example, in psychology, linguistics, mathematics, information theory, educational methods, sociology. It should include such general contributions as appropriate historical and biographical sketches.

EDITORIAL CONTENT

Fundamentally, the editorial content of the *STWE Review* is determined by the statements just made. But more specifically, the content of any volume should be measured against the following criteria:

1. Does the content adequately represent most or all of the specialized occupational interests of the members?

2. Is a substantial part of the content likely to be of general professional interest to the whole membership?

3. Does the content contribute significantly to the body of information which will be handed down in some form to the future?

4. Is the content presented in a form and a manner which will reflect credit upon the profession?

With slight modifications, these criteria should be applied to any issue, to any article submitted for publication in the *Review*, or to any idea in the mind of a potential author or to any article appearing in another publication from which it might be reprinted.

STWE Editorial Board

W. Earl Britton
Anne L. Gregory
H. C. McDaniel
Robert A. Sencer
Frank R. Smith

SCHEMATISM

Robert L. Wallick

As machines become more complex, the problem of the technical writer becomes more difficult because words about a complex system seldom mean anything until they are transformed into a mental image. The schematic diagram is becoming more important as an aid to the writer in creating the proper mental image of systems and components in the mind of the reader of technical literature.

This article is intended as an aid in the design of schematic diagrams. Emphasis is placed on simplicity and good layout to focus attention only on those fundamentals needed for rapid comprehension of an operational system.

DEFINITIONS

Schematism is a noun which means a systematic arrangement or disposition of parts. In reference to a drawing it means that the parts shown are systematically arranged for a purpose.

The word *schematic* is an adjective and should be used with a noun such as the word *drawing* or *diagram*. It is often used in an illustration title without the accompanying noun, which has led many to think of it and use it as a noun. *Schematic* is the symbolic quality of an illustration and is an antonym for *pictorial,* which is the realistic quality of an illustration. Either or both qualities can be and usually are present to varying degrees in a line drawing.

Schematic is a quality most generally associated with and sometimes misused synonymously with *diagram*. For this reason, a diagram must be defined before continuing to discuss schematism.

DIAGRAMMATIC RELATIONSHIPS

The subject of a diagram is usually wire, rope, cable, tubing, or pipe, each of which can easily be represented by a simple line. The objective of a diagram is to show the connections of the subject between couplings, valves, switches, terminals, pulleys, and other components. It is not the purpose of a diagram to show spacial relationship between the various components, the physical appearance, or the operation of the components.

A diagram in most cases is a symbolic illustration designed to achieve a static objective. It shows "what" and "where." The objective is to identify and locate wire, cable, or tubing in a system or assembly. A diagram is used functionally as a tool of the engineer or trained technician.

It is possible to attain a dynamic objective (show operation, movement, or flow of energy) with a diagram of a very simple complete system or assembly. However, the clarity and effectiveness will depend entirely on the degree of technical knowledge of the

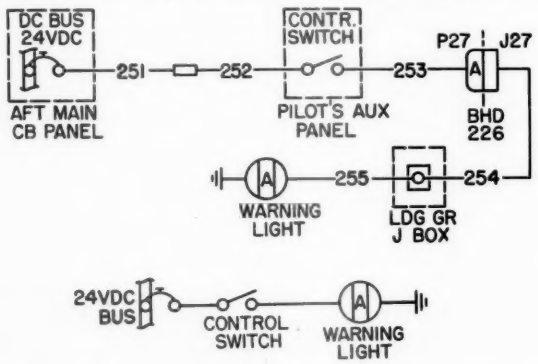


Figure 1—Comparison of Wiring Diagram (Above) and Schematism (Below)

subject already possessed by the reader. A schematism such as that shown in Figure 1 should be used for this purpose.

SYSTEM PICTURE

The very simple system can sometimes be illustrated in a manner that will show the location and appearance of components or parts, as well as how the system performs the function for which it was de-

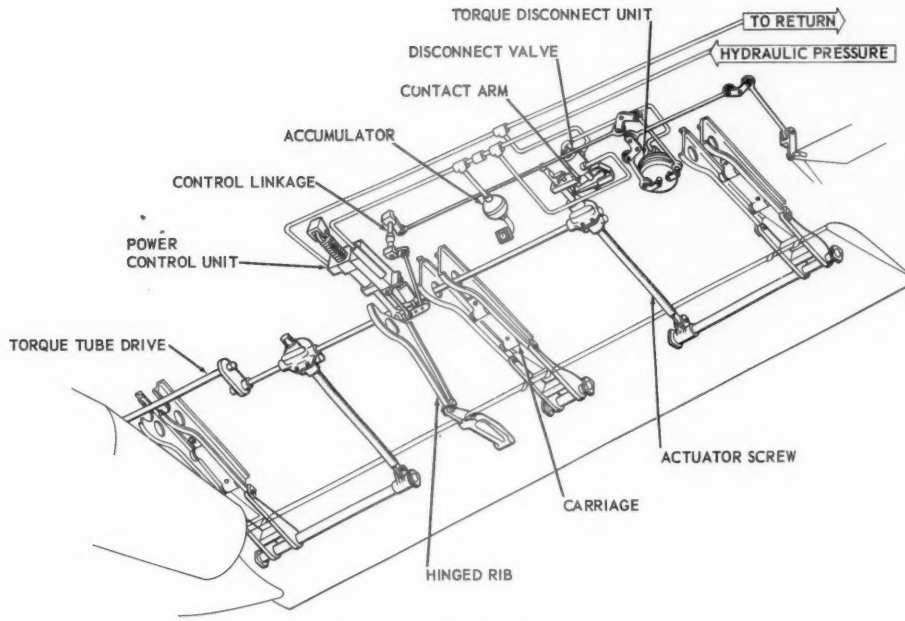


Figure 2—System Picture

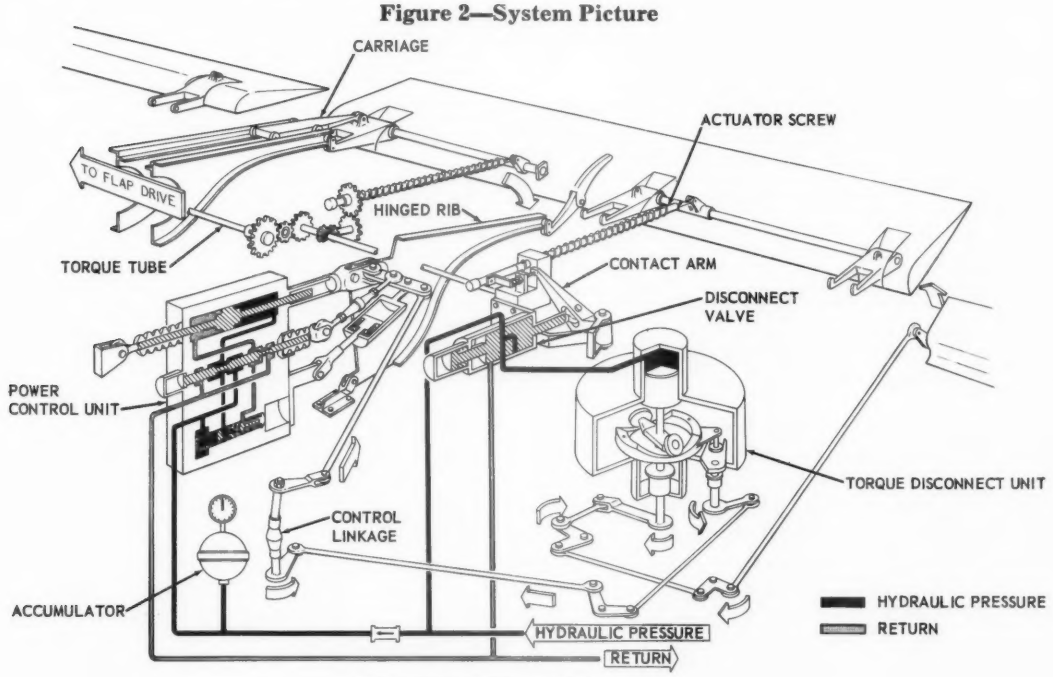


Figure 3—System Schematism

signed. A pictorial representation of a more complex system is seldom enough. A study of the flaperon system picture will show only what units comprise the system and approximately where the units are located. A pictorial representation of the system (see Figure 2) will achieve a static objective by showing "what" and "where." It will not show how the system moves or operates unless the reader already knows the function of each component shown.

SYSTEM SCHEMATISM

For more complex system presentations, a system schematic diagram is required to supplement the picture. A symbolic illustration designed to achieve a dynamic objective, the system schematic drawing shows how a system moves and operates. It shows a person of a required experience level how the work for which the system was designed is accomplished (see Figure 3). All

structural detail not actually contributing to the achievement of this objective is omitted. All detail adding to the understanding of the functional property is augmented and presented in the most direct and definitive form. In a pure schematism, spacial relationship between components is ignored in the layout unless it physically contributes to the operation of the system.

COMPONENT SYMBOL DESIGN

In selecting or designing a symbol to be used in a schematic diagram, the design should be tested to see if it shows what the component does. In order to keep the design of the symbol simple and functional, the appearance of the component should not influence the design. It is also unnecessary to show how the component performs the job for which it was designed. In shape and principle of operation there are many kinds of single pole, single throw switches, but they are all

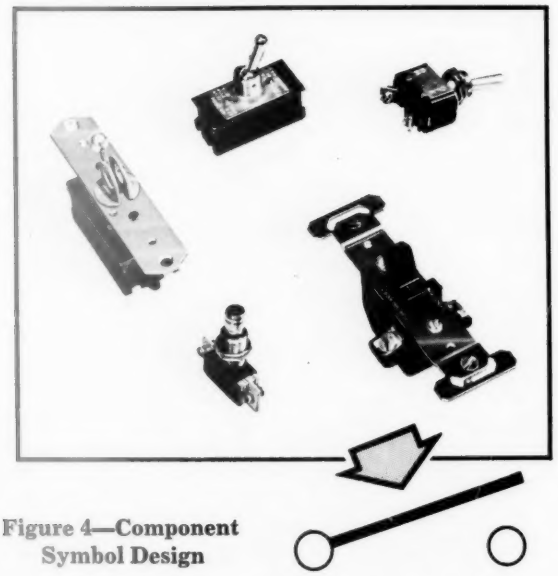


Figure 4—Component Symbol Design

designed to perform the same operation. Put any one of them in an electrical circuit and it will open or close the circuit. The symbol for a common switch (Figure 4) is a good one because it shows what the switch does and no more.

WIRING AND PLUMBING

Size. Where one standard size line can be satisfactorily used to indicate all wires and tubes in a regular wiring or tubing diagram for engineering or manufacturing purposes, the readability of the schematic diagram may be improved by showing a difference between the size of tubes and wires. In an electrical circuit this can be accomplished by showing some difference in the size of a very small indicator line and a very large main power line. In a fuel system, difference in size should be shown between a main fuel manifold and a pressure transmitter line. This will help the reader to more quickly associate the symbolic presentation with reality.

A standard size line should be used unless the use of a larger or smaller line will help the reader to understand the operation of the system or help him to associate the lines shown on the schematic diagram with lines on the pictorial presentation of the system.

Plumbing Intersections and Crossovers. Since there is seldom a requirement to show plumbing fittings on a schematic diagram, intersections and crossovers are indicated by breaking or joining a line at the intersection of another line. Crossovers (no connection between plumbing) should be represented by a break in the vertical line. The horizontal line should be continuous on all schematic layouts.

Although it makes no difference one way or the other, it is suggested that a standard method of showing crossovers be established in order to save time in larger organizations where schematic diagrams are being produced by several illustrators. If they are not consistent, an editor or art director may have all of the completed drawings reworked to make them consistent.

However, no attempt should be made to hold to this rule when a realistic or perspective layout is being used. In this case it does make a difference. In the perspective layout the line in front should always be shown passing over the one behind regardless of the vertical or horizontal relationships.

USE OF COLOR

Where cost is a consideration—and it usually is—color should be used only where absolutely necessary to clarify functional operations and differentiation between "pressure and return," "energized and unenergized," etc. Color should be used as an aid to make it easier for the reader to understand the operation of the system.

Military Specifications MIL-N-4350A and MIL-H-5474B require that color printing be accomplished by using black and primary colors. Orange, a secondary color, can be obtained only by printing red and yellow, one over the other.

If possible, separation by pattern should be used in black printing before resorting to color. If a single color must be used, red is preferred. All of the pattern variations of red should be used before additional colors are employed. This policy will provide a great variety of separation for coding purposes at the lowest possible reproduction cost.

If color is required in coding tubes or wires, black should not be used to illustrate the important elements when red is used to indicate a less significant portion of the function being illustrated. When color is used,

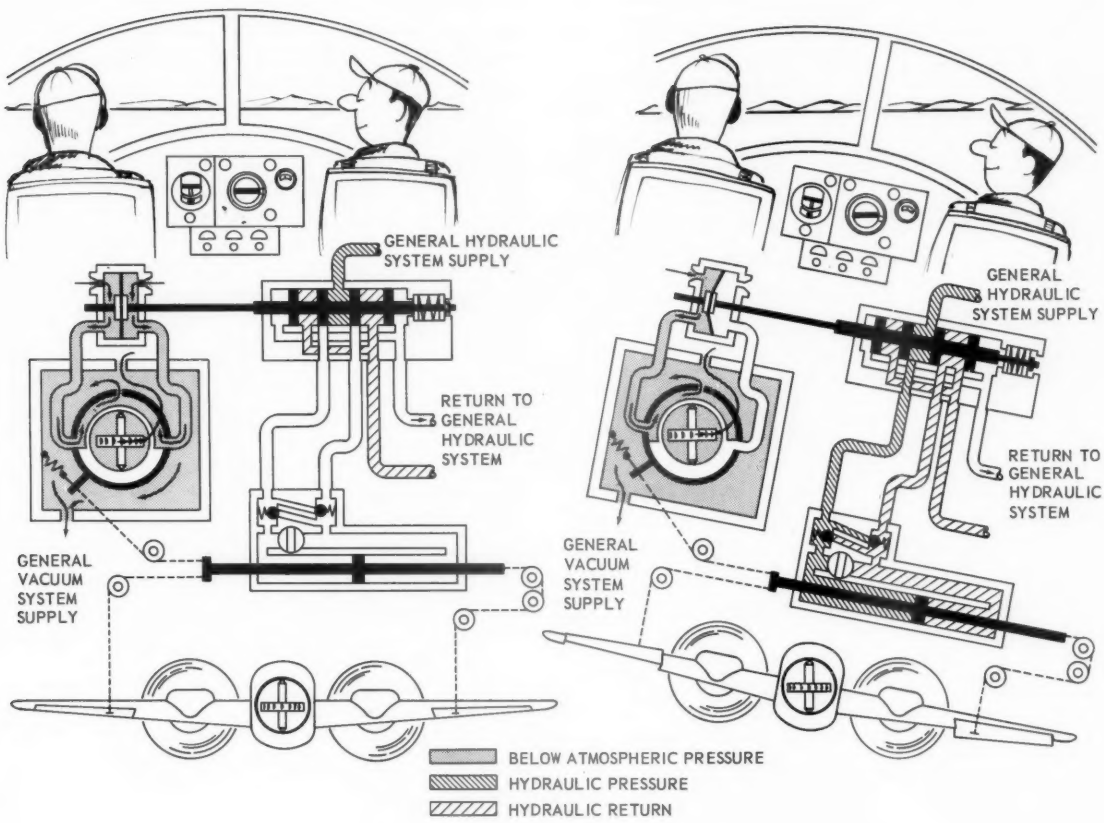


Figure 5—Automatic Pilot Schematism

red should indicate main pressure, primary power, main manifold, high pressure, hot air, movement, or energized circuits.

Wires, tubes, or call-outs on color overlays should be avoided. All essential information should appear on the basic black paste-up copy. Color should be used as an illustration aid; an overprint to code lines only. This procedure is suggested to provide required advance working copy (brownline and ozalid) which can be reproduced from the black plate negative. It makes it possible to reproduce the art work in other graphic forms without rework. This policy also makes it difficult for the printer to destroy the message being conveyed if the color to be overprinted is not properly registered with the black.

AVOID STATIC CONDITIONS

A schematism is the most difficult type of illustration to produce because of the requirement to illustrate movement on a graphically presented illustration incapable of movement. All movement must be left to the imagination of the reader. Since the primary objective of the illustration is to show the operation of the system, it is advisable that a system always be shown in some condition of operation and that the condition be clearly stated in the caption.

In order to thoroughly illustrate the operation, it may be necessary to repeat the schematism in an opposite or neutral condition of operation. By comparing the two illustrations, the reader can more easily visualize the over-all function of the system. Although it was produced a long time ago, a schematism of the Sperry A-3 automatic pilot similar to the one shown in Figure 5 is still an excellent example.

However, is it not considered practical in a handbook to show more than two conditions simply to illustrate the flow of energy or movement under all possible conditions of operation or malfunction. This is a job that should be left for the instructor to accomplish in the classroom with the help of visual aids.

A system schematic drawing which is to be used to familiarize maintenance personnel with the system should also be technically accurate and complete enough to serve as an aid in the functional testing and trouble shooting of the system. In order to better serve its primary purpose, which is to quickly familiarize the reader with the operation of the system, the system schematic drawing should be arranged in the most

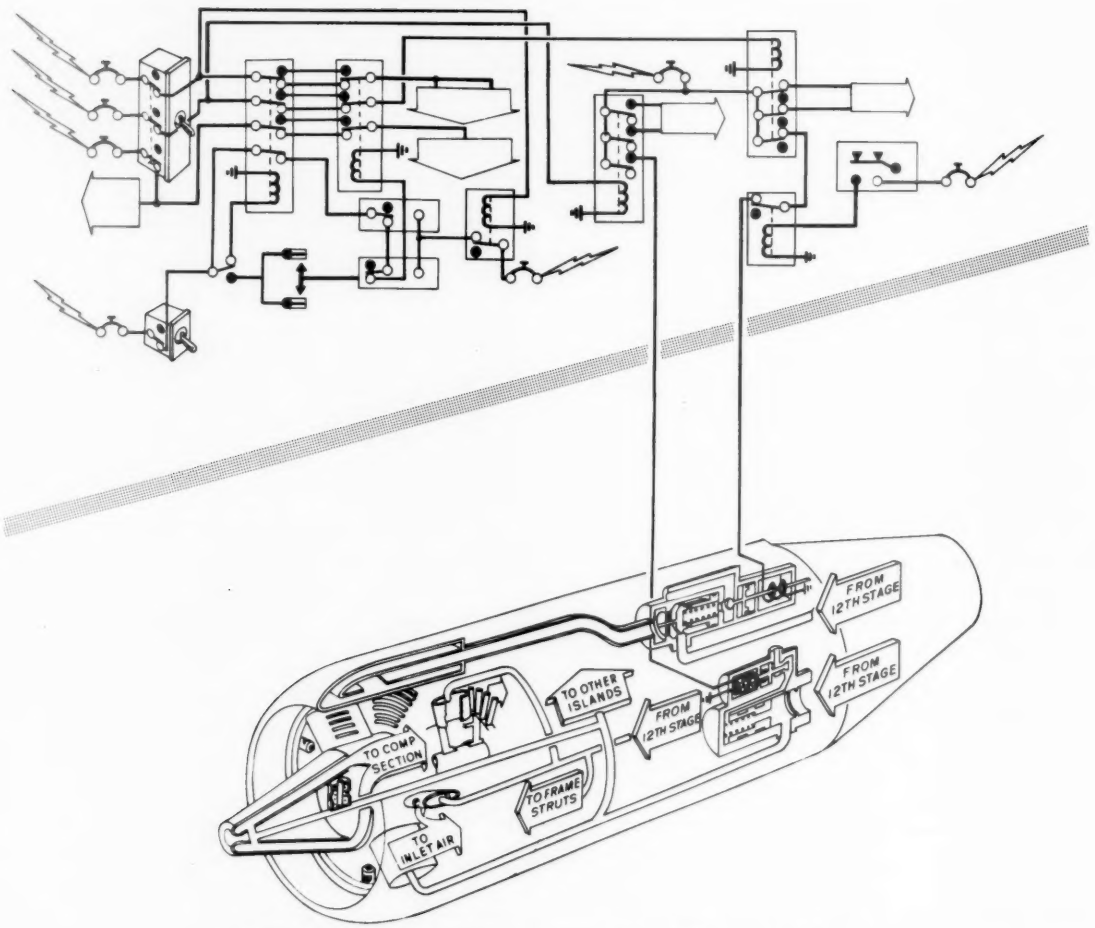


Figure 6—Combination Schematic and Realistic Layout

simple and orderly manner—easy to read and understand.

As an aid to this end when designing this type of drawing, it is suggested that the illustrator appropriately use the two basic types of layout: (1) realistic and (2) schematic (see Figure 6).

In making a schematic layout the illustrator disregards the spacial relationship between one component and another. He attempts to locate the source of power at the left or top of the page and to locate the components in a simple, orderly manner to lead the reader's eye from left to right and top to bottom of the page.

PRINTED SYMBOLS AVAILABLE

Standard symbols can be used whenever the layout is entirely schematic. The main advantage to this type of layout is that the schematism can be constructed by more economical mechanical means. Printed symbols of almost any type of system component can be procured from various large artists' suppliers. A great variety of symbols developed by the Air Force, major aircraft and electronic equipment manufacturers, and others may be obtained from such sources. It is suggested that the desired symbols be procured on the matte surface acetate backed by a heat-resistant, pressure-sensitive adhesive. They may be applied to vellum, straight lines inked between the component symbols, and clear Chartape imprinted with various patterns for coded lines added to connect the components. Ozalid copies can be made without melting the adhesive. A very effective and economical schematic diagram can be produced in such a manner.

In the realistic layout of a schematic diagram, the illustrator should attempt to retain the spacial relationship between components which very often requires that it be shown in perspective rather than as a flat view. In this type of layout it often becomes impractical to use the standard component symbols.

However, this type of layout is often desirable because it improves the readability of the illustration by

decreasing the time required to associate the schematism with the accompanying realistic illustration of the system (see Figures 2 and 3).

CONCLUSION

Each illustration used in this article as an example has been called either a picture or a schematism. But the system picture is not a photographic copy of the real system. Unimportant and distracting details have been eliminated, and the size and location of some parts have been altered to achieve the objective of the illustration. The illustrator has actually added a little schematic quality to the picture. Likewise, all of the schematic diagrams in this article have been given a little pictorial quality. They are neither entirely schematic nor entirely pictorial.

To limit the illustrator to the use of either schematic or pictorial art work is like limiting the pianist to only one base key and one treble key, and then telling him that he may proceed to play anything just so long as he uses no more than the highest and the lowest key on the keyboard. What is wrong with using the full range of keys?

Pictorial and schematic qualities should be used to varying degrees. The proficient illustrator learns to use the correct proportion of these qualities to show how the functional system operates as well as the general appearance and relative location of the system components. Ω

About the Author . . .

ROBERT L. WALLICK *is Supervisor, Illustration and Production Group, Technical Publications Unit of the Wichita Division, Boeing Airplane Company. His experience in the preparation of illustrations for technical publications, as well as training aids, dates to 1942 and includes service with Curtiss-Wright Corporation, North American Aviation Corporation, and the United States Air Force. Wallick's present position, which he assumed with Boeing in 1949, entails production of illustrations and reproducible copy for technical manuals and brochures. In addition, he is responsible for the development and production of training transparencies for the Wichita Division.*

The College Professor of English and On-the-Job Training*

Erwin R. Steinberg

College professors of English can be of considerable value to industry in what is often a complicated internal problem — on-the-job training in technical writing. In the role of communications consultant the English professor is in a unique position to offer an objective evaluation of a company's needs in this area. Because of the experience and knowledge which he possesses, the professor can promote an atmosphere of student acceptance that is seldom enjoyed by the fellow-employee-turned-teacher.

Let me relate several typical examples as case studies. A power company was having difficulty with its linemen and maintenance men. Many of their repair jobs and installations took much too long. When questioned, the men claimed that the specifications were inadequate and did not supply enough detail. Other times there were plenty of details, but they were confusing, or else there were too many details. The engineers who wrote the specs couldn't understand the complaints. I don't know whether the management of the power company recognized it, but the impasse was fraught with considerable danger. Costly strikes have resulted from such situations.

Sensing a communication failure, the engineer's supervisor called in an English professor as a communications consultant. First the consultant discussed the problem with the supervisor and examined samples of the specifications. Then he interviewed some of the men in the field. Since he represented neither management nor the engineers and thus could not be suspected either of wanting to place blame or of supporting personal interests, the men dealt frankly with him. They felt that many of the specs were poor, but they could not state the inadequacies clearly. They were willing to answer the consultant's questions, however. With their help, the consultant discovered the following problems:

1. On occasion, the engineers left out necessary information. What was sometimes self-evident to them was not always as obvious to men without their training.

2. Sometimes the engineers used unnecessarily technical language.

3. Sometimes the engineers organized the specs in a way which was "logical" to them; but which did not reflect the order of the procedures that the men in the field had to follow.

4. Often the sentences in the specs were too long and complicated for easy understanding in the field.

SEMINARS CONDUCTED

The consultant sifted through his set of specs for examples of the various problems. Then he ran a series of seminars for the engineers who wrote the specs. First he discussed with them the men in the field who used the specifications: their education, the level of their technical competence, the conditions under which they worked, their attitude toward their job. He helped them to see that before a technical writer can employ the cardinal principle of communication — i.e., put yourself in your reader's (or listener's) shoes — he must first be sure that he understands who the reader is and what his problems are. Then he presented the group with several specifications which exemplified one of the problems he had turned up. Under his guidance, the group examined the specs from the point of view of the men who used them, the linemen and the maintenance men. They isolated the difficulty, corrected it in the samples, and discussed how to prevent it in future specs. They dealt with the three other problems by the same procedure.

As a final step the group wrote a specification for writing specifications. Although the consultant did the actual writing, he used the materials and concepts developed by the group in the seminars.

Before I draw any conclusions from this instance,

*Presented at the STWE Sixth Annual Convention, Washington, November 17-18, 1958.

let me supply another. The management of a large chemical company made its decisions on the basis of what it learned from a "monthly progress report." Essentially, the report measured the last month's accomplishments against what had been programmed and made predictions for the immediate future. At the beginning of each month, the plants and research and development laboratories sent a mass of statistics and other information to the various departments at headquarters. Piled up, it made an imposing mound. In each department, two men were given the difficult task of resolving their department's data into a readable, meaningful report. These reports then went to the Control Department, where a group of men had the even more difficult task of organizing them into a single report which would give management a good picture of what the company was doing and how its recent accomplishments compared with earlier expectations. Management needed this information to make its decisions on future actions. But the reports were not as helpful as management wanted them to be. They were too long. And they were too hard to read.

REPORT ANALYSIS MADE

Recognizing a communications problem, management called in a pair of college professors of English who were experienced communications consultants. The two men talked with the company's president, with members of the Control Department, and with the people in the various line and staff departments who wrote the departmental reports. Then they examined a whole series of progress reports very carefully and moved from them to the departmental reports from which the progress reports had been composed. The consultants turned up three different kinds of difficulties: problems of diction, style, and semantics. Partly because their information was often very complicated and very technical, partly because their training was poor, and partly because they wanted on occasion to avoid going out on a limb, the men who wrote the departmental reports turned in documents which were wordier and weightier than they needed to be. For the same reasons, their sentences were too often clumsy, or even tangled. Main clauses hooked together with *and's* flattened out causal relationships. Lack of parallelism where it was needed misled the reader by distorting the ideas being communicated.

The semantic problems resulted largely from the writers' inability to put themselves in the place of the people who were to use the reports. A writer would report, for example, that sales of Phiafilm exceeded program because of several unexpected large orders. Such a statement seemed to be an explanation, but actually it told managment absolutely nothing. It never answered the real question of what caused the unexpected orders. If they were a result of heavy public demand for automobiles which caused the automobile manufacturers to replenish depleted inventories, that was one thing. If they were a result of a wildcat strike which closed a competitor's plant, that was something else again. And if they were a result of the falling quality of a competitor's product or the improved quality of their own product, that called for still other conclusions and consequent actions.

The defects in the departmental reports led the men in the Control Department to treat them more cavalierly than they should have. Recognizing the wordiness, they hacked away at the reports with a blue pencil. But sometimes they hacked a little too much. When a cliché or bit of jargon turned up too frequently, they removed it. But too often they substituted another phrase which was just as trite or which didn't communicate any better. Faced with purported reasons which didn't really explain anything, they took them out. But they often left gaps in the fabric of the writing as a result.

COMPOUNDED PROBLEM

The result of all these problems, the consultants discovered, was not only progress reports which were not as useful as they could have been, but a growing irritation between the writers of the departmental reports and the members of the Control Department. The first group felt that the results of its labors were being mistreated and even distorted, the second that it was misunderstood. And neither group felt that the other really understood or appreciated the amount and difficulty of the work it did.

The consultants set up two seminar groups. Each group contained two representatives of the Control Department and one of the two members in each department responsible for the departmental report. There was no overlapping of personnel between the two seminars, except of course for the consultants, who met with each group for an hour every week.

As an initial problem, the consultants culled a dozen extremely wordy passages from the monthly progress reports and from the departmental reports and presented them to the groups for analysis and improvement. Under the guidance of the consultants, the members of the seminars identified the difficulty, improved the sample passages, and discussed methods of avoiding wordiness in their own writing in the future. The consultants followed the same procedure with the other writing problems they discovered. At the conclusion of the series of seminars, each member had a conference with one of the consultants in which his personal writing problems were discussed.

As a result of the seminars, the participants learned not only how to deal with eight or ten specific writing problems, but also a procedure for recognizing and dealing with writing problems that they could apply in

the future. An important byproduct of the seminars was that the two groups which had begun to distrust each other—the writers of the departmental reports and the members of the Control Department—gained insight into each other's problems and realized that the other did not intend any unkindness or skulduggery.

The consultants summarized the conclusions reached by the seminar and added to it a style sheet designed to promote consistency in the preparation and writing of the departmental reports. The company set this material up in sturdy, attractive brochures and presented one to each of the members of the seminar. (The men jokingly referred to them as their "diplomas.")

VARIED ROLES POSSIBLE

I can offer many other examples of college professors of English in on-the-job training programs. Recently one of our group at Carnegie Institute of Technology surveyed the written and oral communications problems of the engineers in a very large manufacturing company. His final report was in the form of a recommended course in communications to be given to the several hundred new engineers that the company hires every year from the colleges and universities all over the country. The consultant and one of his colleagues initiated the course for the company.

Another member of Carnegie's English department reviews the news releases put out by the technical information department of a major industrial concern and holds periodic conferences with the technical writers who produce them.

Another company has hired a consultant (again a college professor of English) to help its engineers with their oral presentations—some 200 of them a year. The consultant reviews the paper in its written form, makes suggestions for its improvement, and rehearses the speaker to help him with his delivery.

I have given two case studies in some detail and sketched in a few others for several reasons:

1. To show the kind of leadership that college professors can provide for on-the-job training programs.
2. To explain some of the techniques that they use.
3. To provide the basis for several generalizations about what they can and cannot do and how they can best be used.

CRITICISM BY A SPECIALIST

One's writing is extremely personal—a projection of one's self, to use the psychological jargon. People don't like to expose it to the manipulation of just anyone. Just as men are reluctant to discuss their physical weaknesses or bodily ills with anyone other than a doctor, so they are reluctant to discuss their writing weaknesses with anyone other than a "language doctor," if I may coin a phrase. A person doesn't like to have his prose tampered with any more than he does his appendix. If either *has* to be operated upon, however, he prefers that it be done by a specialist. As we saw in the two examples I gave, a college professor of English, by virtue of his training, experience, and position, commands the respect and carries the authority required by the situation.

Furthermore, as the examples showed, many communications problems that arise actually require some sort of arbitration. Because the college professor is a member of the academic community, which is often considered unworldly but perhaps for that very reason also objective and honest, the parties involved are inclined to trust him. Because he is an outsider, the college professor actually does bring an objectivity to the situation that few people in the company could manage.

I need not go into detail about the other qualifications of the college professor: his knowledge of language, its resources, its uses, and its pitfalls; his understanding of the psychology and philosophy of communication; his experience as a teacher.

Many more college professors of English could function capably as communications consultants than are currently doing so. If they are chosen with the same care as other consultants hired by industry, they will provide the type of service I have described. Ω

About the Author . . .

ERWIN R. STEINBERG *is Head of the Department of General Studies in Margaret Morrison Carnegie College of Carnegie Institute of Technology, Pittsburgh. He is Vice-Chairman of the Pittsburgh Chapter of STWE and is a member of the national Committee on Education and Professional Development. Dr. Steinberg is a member of the Board of Directors of the National Council of Teachers of English, Assistant Chairman of the Conference on College Composition and Communication, and a member of the Modern Language Association. He has contributed to many professional journals and to several books. With William M. Schulte he is collaborating on a book,* Communication in Business and Industry, *which is scheduled to be released by Henry Holt and Company in March.*

In-Service Training for the Writer-Scientist*

Madeline D. Warnock

"Why Can't Dr. Johnson Write?"

This is the increasingly urgent problem of innumerable supervisors, administrators, documentalists, and editors. It is also a worry to Dr. Johnson. Why is it that Dr. Smith, with his PhD *magna cum laude,* cannot report his findings so that his colleagues can follow his work? Why did Bill Adams quit his job when he found that monthly reports would be required? Why can't Colonel Jones say "Yes, you may buy a new microscope" in less than two pages, single-spaced?

The answer is simple: They were never taught to write.

It is true that they have degrees from recognized schools and probably were subjected to English composition in their undergraduate days. If they are engineers, they may have had a one-semester three-hour course in "Technical Reports." Most of them have probably written a thesis.

Very rarely, however, was their instruction in writing related to their major subject. In addition, instruction in their major subject did not require them to develop skill in writing. As a result, we have a whole generation of scientists who are highly trained in their professions but many of whom have little ability to communicate.

Those of us engaged in editing and publishing technical reports recognize the need for training in writing. Administrators, too, have been concerned for some time by the inadequacies, inaccuracies, and awkwardness of the reports they receive. Attempts to improve the quality of technical reports have varied from a supervisor's memo slip reading "This stinks; do it over" to compulsory attendance at seminars and workshops.

The U. S. Army Chemical Corps Laboratories at Fort Detrick, Maryland, have, like other installations, tried most of the methods recommended for improving technical writing. But we were stalemated.

The gravity of the situation demanded action. We have gradually evolved a system of guidance and education that has alleviated some of the problems; we feel that the principles, at least, are sound.

THREE AIDS TO AUTHOR

One point should be emphasized. We have learned that in-service training does not consist solely of class work; it is a continuing process of education by whatever means are available. We believe that there are three major, interrelated ways of helping the author, and we try to keep all three functioning regularly. They are formal classes for as many students as we can accommodate; written guidance in the form of instruction manuals, kept current by frequent revision; and immediate, friendly availability of an editor to answer a specific question at the moment it arises.

Our editors had been able to maintain amicable relations with authors with few exceptions. Our most logical first step, then, was to issue instruction manuals, inadequate by present standards, but better than nothing. Our next step was to initiate group training. I was invited to teach a two-hour semester course in technical report writing.

In setting up the course there were certain requirements that we considered necessary: there were to be 20 persons in the class; students were to be volunteers actively engaged in writing; and there were to be no parasites registered under the pseudonym "auditor." Each author had individual writing problems, and I could not give individual attention to more than 20 students in a semester. Because it was the active writer who needed help, we deliberately weeded out those who had only an academic interest.

The response to announcement of the course was gratifying. The first time it was offered, 34 persons applied. The second time, 42. Twenty applicants were chosen on the basis of (1) my personal knowledge of their inability to write and eagerness to learn and (2) by organization, so that at least one person from each

*Presented at the STWE Sixth Annual Convention, Washington, November 17-18, 1958.

division could share his training with others in his own office.

Two phases are involved in teaching technical writing successfully. Each phase complements the other. First, the student must recognize *why* he should learn to write. After this first phase of orientation, the second phase of actual instruction is much simpler.

REPORT WRITING SEQUENCE FOLLOWED

The curriculum we used roughly parallels the sequence followed in writing a report. The first three lectures covered reasons for reports, organizing the report, and the techniques of literature search. Several subsequent classes dealt with writing *per se*—grammar, sentence structure, style, and format. The last two lectures covered the preparation of the auxiliary sections of a report, including abstracts and illustrations.

The two-hour class period was arranged so that the first hour was devoted to lecture, the second to a workshop pertaining to the lecture subject. Classes were informal, with frequent questions and debates. Students established much of the subject matter by their questions. This was logical; they were there to learn, and their questions revealed those areas of report writing with which they were having difficulty.

The first two-hour session was devoted to the reasons for writing well and was personalized in every way possible. Two points were stressed: the ethical obligation of the individual to share what he has learned at government expense and the personal benefit derived from well-written reports.

Once the students were convinced of the value and necessity of writing well, they approached subsequent classes eagerly. The second lecture covered organization of material. Different outlines were demonstrated—chronological, cumulative, order of importance—and a sample list of subtopics or section headings was arranged and rearranged during the workshop until the class agreed upon the most acceptable order of presentation.

The workshops were informal discussion periods. Usually, each student was given a list of about 20 sentences illustrating the lecture subject. The class analyzed, broke down, and rebuilt each sentence in the light of the lecture and of previous lessons. Members of the class volunteered eagerly, and there was no restriction on questions that sometimes led far from the subject of the lecture.

STYLE DEVELOPED

Having learned to sift, evaluate, and organize the material at hand, the students were faced with the problem of expressing it in the best form. This was the second major section of the course and required several weeks.

By the third or fourth session, the class was scarcely identifiable as teacher and students; it was a unified team dedicated to improving the writing skill of each member. Each individual, teacher or student, contributed to the group knowledge according to his ability and background.

Grammar was reviewed briefly, not as grammar, but as an accurate and efficient way of communicating.

One of the most effective techniques developed in this course was the use of first-hand material. For several years our Editorial Section has kept a notebook of classic "bloopers" submitted for publication. These range from long, involved sentences to completely absurd errors. They were sorted and used as workshop material for each session. By knowing that these errors were not the result of the teacher's active imagination, but had actually been committed, the class recognized more clearly the mistakes that can occur.

One of the most oppressive problems in technical writing is a firmly entrenched attitude that, to be scholarly, a paper must have many long words. The English language is replete with good, basic, expressive, short words.

We stress the need for a large vocabulary. And herein lies a danger: "large" does not mean "exotic." There are colorful, decisive, concise words, especially verbs, that carry precise meanings. There are others—accomplish, make, perform, get, take—that are little more than blank spaces to be hurdled in the reading.

VERB USAGE EMPHASIZED

Two principles were emphasized throughout the course: the maximum use of verbs and the elimination of verbiage.

Professor W. Earl Britton of the University of Michigan presented a paper on "Efficiency in Writing" before the spring meeting of the Association of Technical Writers and Editors in May 1955. His recommendation for maximum use of the verb form has been supported by our experience both in class work and in routine editing. This technique is one of the most productive we know for concise and accurate writing.

We insist upon the need for brevity with clarity, and we bracket the two. Brevity without clarity can be devastating, as witness the sentence "Two monkeys were acquired to train animal caretakers." A counterpart was just as overwhelming—"Immediate therapeusis was instituted in a successful attempt to abort a fatal termination." Translated from medical phraseology that means "Prompt treatment saved the patient's life."

Most drafts, even "final" drafts, are laden with needless phrases. It is unnecessary to write "The tank was charged at a rate of 5 gallons per minute." Certainly the reader knows that "gallons per minute" is a rate. After a few class sessions, the students are less inclined to use redundant phrases.

One misconception common to most authors must be overcome. When he is told to shorten the report, the author immediately visualizes editorial scissors viciously snipping whole paragraphs, even whole pages, from his work of art. Usually, drastic surgery is not necessary, but each sentence is trimmed or two sentences are consolidated into one, so that no sentence need be sacrificed entirely.

In our course we also investigated related factors involved in producing technical reports. The head of the technical library discussed the literature search that precedes every research project, the resources of our library, and their most efficient use. Another lecture delved into the relationship of author and editor: what the author may expect of the editor who prepares his report for publication and what the editor expects of the author.

Our examinations were short and informal. A mid-semester and a final were considered adequate. The material was the same as that used in the workshops. Homework was required each week. Late in the semester one assignment was a critique of the course, its presentation and its coverage of individual problems. The term paper was a review of a book on technical writing.

Two sessions were held open for last-minute arrangements. Sometimes a visitor spoke on some aspect of technical writing, or an extra period was devoted to discussion of a subject chosen by the class. One year the class toured the drafting, photography, and printing shops, to learn first-hand the elements of publication production.

STANDARDIZED REPORTING SYSTEM

The establishment of this class has not distracted us from the other two facets of our training program. We have published new, detailed instructions on several aspects of technical reporting. These have standardized the reporting system enough that the authors find writing much easier, and the drafts are received in better form.

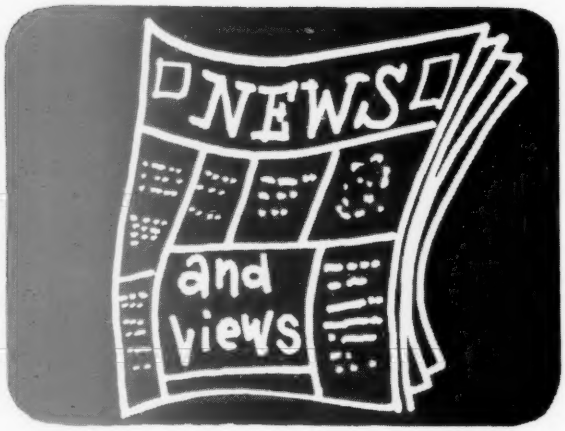
The third facet of our program dealt with author-editor relationships. In spite of the traditional antagonism of authors toward editors, we have established a cooperative atmosphere between the two groups. In addition to our routine editing duties, we are immediately available by telephone to decide whether to use "principle" or "principal," "affect" or "effect," a comma or a semicolon. We encourage authors, if they are dubious about their work, to bring it to us either at the organizing or at the writing stage for consultation and advice.

Fortunately, the editors at Fort Detrick are recognized as professional personnel. It is generally accepted that, as an author is a professional engineer, bacteriologist, or chemist, the editor is a professional in publications. The two, combining their training and working as a team, generate the report that is the product of our laboratories. This mutual recognition and respect has made our joint responsibility for publishing easier and more enjoyable for both groups.

Any measure of success that we have had with our reporting program has been based on this over-all training concept and on the cooperation of other groups. We could not have succeeded without the eagerness of the authors to learn, and their willingness to apply the guidance we gave them, or without the support and encouragement of management. No program of this kind can succeed without the general acceptance and backing of both administration and the individual author. Ω

About the Author . . .

MADELINE D. WARNOCK *is Chief of the Editorial Branch at the U. S. Army Chemical Corps Laboratories, Fort Detrick, Maryland. A charter member of the Association of Technical Writers and Editors, she has been active in the national organization for the past six years, recently serving as Chairman of the STWE Education Committee. Mrs. Warnock will be remembered for her article "Mass Production of Technical Reports," which appeared in the April 1958 issue of the* Review. *She is a senior member of STWE and a member of Theta Sigma Phi, professional journalism sorority.*



By Cleo Gray

VOLUNTEERS?

From Walt Barden's *Technical Data Newsletter,* Van Nuys, California, comes a recommendation for a project that some STWE chapter may be eager to undertake. The *Newsletter* points out that MIL-M-00574B (USAF) calls for capitalization of abbreviations. Walt recommends that some organization such as STWE ". . . pick up this spec requirement—determine its effect on member writers and editors—make recommendations to MCM-TTP, Hq. AMC, W-PAFB."

Although the writer or editor's problem in changing from a long-established point of style is not great, it does require time and effort that could well be applied to more important details. In addition, if recommendations by STWE of even minor points are accepted by the military, we are farther along professionally.

WHAT IS MHSAC?

Mr. R. C. Fouhy sent us an interesting piece, which follows, on the participation by the Mid-Hudson Chapter of STWE in the Mid-Hudson Science Advisory Council. The Council's activities are similar to those conducted by the Education Committee of the Dayton Chapter which were described in the guest editorial in the October issue of the Review *by Frank R. Smith, Head of the Department of Humanities of the Air Force Institute of Technology in Dayton. Mr. Fouhy is Chairman of the Mid-Hudson Chapter and a member of the MHSAC Executive Committee. He is Staff Assistant, Publications Department, IBM Product Development Laboratory, Poughkeepsie, New York.*

MHSAC stands for the Mid-Hudson Science Advisory Council. The Council was formed several years ago as the answer to the growing problem of how industry could aid the science classes in this area. The Council exists to make the science resources of the Mid-Hudson Valley area conveniently available to science teachers in all high schools and colleges. As an organization composed of representatives from all the professional societies of the area, the Council provides a single medium of contact between teachers and industrial scientists and engineers.

Its committees are set up to handle a diversity of operations. There are committees for personnel, newsletter, scholarships, National Defense Educational Act (program in area schools), group events, speakers, industrial tours, science fairs, surplus equipment, and summer employment for teachers.

The liaison people are selected from various industries in the Mid-Hudson Valley. Generally, the men selected live in the district where the school is located.

Naturally every type of industry in the Mid-Hudson Valley is represented in the Council. The mailing list of the MHSAC Newsletter reads like the call board of the Chamber of Commerce. Some of these are: IBM, The Texas Co., DeLaval Separator Co., Central Hudson Gas & Electric Corp., Schatz-Federal Bearing Co., Daystrom Electric Division of Daystrom, Inc., Hercules Powder Co., DuPont Co., Skydyne, Inc., Fargo Mfg. Co., Star Expansion Industries, and Polak's Frutal Works (chemical extracts, perfume bases, etc.).

What does STWE do for the Council? Our principal duty for MHSAC is the publication of the monthly newsletter. In addition, our two representatives to the Council perform any other writing or publicity duties that may be required.

RECOGNITION

Industry and education are beginning to recognize the professional nature of technical writing and the specialized training required by technical writers. Efforts are being made to make the training available in colleges and universities and to guide young people into the field.

"Teaching the Skills of Technical Writing" was written by Paul Porcasi for the July issue of the *California Sun,* graduate Journalism publication of the University of California. Mr. Porcasi, an experienced technical writer, is now a candidate for a Master's

degree in journalism. He divides technical writing into the four types with which he is familiar—the technical manual or handbook, the technical report, the technical brochure, and the task analysis or personnel information report—and defines these types within the limits of his own experience. He discusses basic skills required for all types of technical writing, recommends specific college courses,. and outlines the classroom methods he believes would be effective.

The occupation of technical writing has been clearly and comprehensively described in "Technical Writer 0-06. 85." Miss Corinne Fredenburg, Editor, Chronicle Guidance Publications, Inc., Monrovia, New York, sent us a copy of the publication issued by her company in the *Chronicle Occupational Briefs* series. The article analyzes the scope of technical writing and describes particular types of publications and the work performed for them. Specific salary information and educational requirements are given. Accredited colleges and universities (1958) where training for technical writing may be obtained are listed.

AS OTHERS SEE IT

The following article, which appeared in the San Francisco Chronicle, *points up one of the well-worn themes of the technical writer; but in the voice of the suffering reader, the subject has a fresh tone.*

RUGGEDIZING THE LANGUAGE

Down the road a piece, at Sunnyvale, Santa Clara County, the Lockheed Missiles and Space Division is gestating an electronic brain especially to put and keep nuclear submarines in condition to fire ballistic missiles. This device—familiarly known as ACRE, for Automatic Checkout and Readiness Equipment—bodes ill not only for enemies of the nation, but also for grammarians, philologists and editorial writers who think they have a working knowledge of the American language.

We base such forebodings on a news release announcing ACRE—a document prepared by public relations specialists with the express intention of informing the layman, yet one which casually talks about ACRE's "operational verification function," its "diagnostic routines" and its uncanny ability to "read quantitative test results."

As if ACRE's built-in diagnostic routines had anticipated our discomfiture and prescribed a remedy, the announcement now trotted out a research engineer to describe and explain ACRE "in general terms." He said:

"Under control of a stored program, an appropriate stimulus generator is selected and adjusted. The stimulus, directed to the proper missile umbilical wire, elicits a response from the missile sub-system. This response returns to ACRE, where it is digitized and evaluated on the basis of stored test limits."

Somehow, the message though loud was not clear. It left us in no shape to appreciate the further revelation that ACRE performs its wonders through a GO/NO GO form. But there was a flash of dim light glimmering through the disclosure that the whole thing is "packaged in three ruggedized racks." Package deals are old stuff for us, and we understood "ruggedized" through recent acquaintance with "finalized," a verb form of identical lineage and supererogation. We knew right off that it meant that the racks were beefed-up, or reinforced, or made strong enough for the job—but what job we will never understand.

The discouraging circumstance is that neither Webster nor Roget can help us understand. The language keeps straying farther and farther from us as it dallies with the electronic era and the space age. As far as we are concerned, it has snapped the umbilical wire.

THE PARTICIPLE IN MEDICAL WRITING

The experienced technical writer is constantly looking for guidance in how to polish his writing. He hears and sees much that is valuable to the beginner, and he is frequently reminded in technical-writing seminars and institutes of the principles he learned his first year on the job; but not very often does he find anything else beyond the college-composition level.

The "Participle in Medical Writing," by Dr. W. Earl Britton is an excellent example of the kind of guidance professional writers need. Though the article is slanted to medical writers (it appeared in the *University of Michigan Medical Bulletin,* March 1959), the principles of using participles naturally apply to all writing.

Dr. Britton discusses the "communicative function of the participle and the structural problems it poses." He illustrates how the misuse of participles causes inverted subordination and failure to differentiate between levels of significance in sentence materials. He demonstrates the effective use of participles to simplify structure and eliminate many *of's* and *which's.* He further applies the principle of simplification to avoid the overuse of participles. The discussion includes other problems such as dangling participles, false parallels developing when participles and gerunds are used close together, and punctuation of restrictive and nonrestrictive participial phrases. Following is his abstract-like conclusion.

"In conclusion, let me reemphasize the notion that the participle is not just another verb form to provide variety. Although a verb, it can modify, and therefore provides a means of subordinating material. It is a light-duty form and should not undertake the tasks that require finite verbs. Tolerance of the unattached participle grows, but the dangling construction never has been, nor is it today, the principal hazard in using the participle. More serious is the participle whose relationship to its head word is not clear. Such constructions create uncertainty, confusion, and looseness of style."

Instruction Manuals En Masse

Edward E. Rabin

Have you ever had to write, edit, prepare copy, and print one complete instruction manual, ranging in size from 112 pages to 275 pages, every two and one-half days? Motorola's Engineering Publications Department recently had this problem — 40 books in 90 days! This was in addition to maintaining over 50 other current instruction books, 150 odd instruction booklets (ranging in size from two to 32 pages), and various customized assignments.

Before we get into the problem, a brief outline of the organization of the Engineering Publications Department is in order. The department creates and maintains all instruction manuals for the equipment designed and produced by the Communications and Industrial Electronics Division.

One wing of the department consists of the following groups: (1) eleven microwave, carrier, and military writers, three parts list writers, and a supervisory editor; (2) seven two-way communication writers, two parts list writers, and a supervisory editor; (3) two stencil typists, five IBM (reproduction) typists, one layout and keyline girl, and a production supervisor; (4) nine draftsmen and a supervisor; and (5) four men who handle stock room, mimeograph, and bindery activities. Two managing editors and a department manager supervise the over-all activities.

Most "special" (customized) manuals are produced by mimeograph, whereas the books for standard production equipment are offset printed.

Now for the approach to the 40 books. The program to be discussed concerned only the two-way communications writers and the production and drafting group. The other writers and the stock bindery area were not directly affected.

When a new radio set or radio system is introduced, the two-way communications writer is assigned to the project. This usually means writing a complete instruction book covering a family of models, which will use a radio set with the same basic transmitter and receiver, but will differ in the frequency, primary power, installation, or configuration. Upon completion of the manuscript, it is read and approved by the project engineer and edited and approved by the supervisory editor. The book is then submitted to the production group for copy preparation and from there to the printer. This was the *modus operandi* for the group before the "big push."

PLANNING AND SCHEDULING

Our story started at a marketing planning meeting where Publications was forewarned that a substantial change in models would occur in about six months, with engineering information available in approximately three months. At that time it looked as if 33 new books would be required. However, during the interim, seven books were added because of large specific customer requirements. These we call special, or SP, books.

First, we estimated our workload. How many man-hours of writing, editing, drafting, parts-list writing, and production time would this take? Could we do it with our present work force? We plotted each activity, man-hours versus time. The resultant curves looked like mountain ranges and confirmed what we had suspected. Even doubling our force would not solve the problem. And if we did double the manpower, there wouldn't be sufficient time to train them — and where would we put them? Also, once this program was over, we would then have a surplus of help. Something else had to be done. Overtime, of course. Purchase of outside talent, yes. But this still was not a satisfactory solution.

Perhaps a departure from our present methods was the answer. Most of Motorola's two-way communication manuals consist of six to 18 separate sections. There are front matter, description, installation, and operation sections. Then the receiver, transmitter, one or more power supply sections, and control heads and microphones in the case of mobile units, or remote control chassis, metering chassis, and metering panels in the

case of base stations. Finally, several sections were devoted to maintenance of mobile and/or base stations. Forty different books of this type were needed.

ALTERNATE SOLUTION

We considered another approach. Each family of models was broken down as to the type of receiver, transmitter, power supply, control head, etc. We found that many chassis — and therefore instruction — sections were common to the 40 books. Some of the maintenance, control head, and microphone sections would be applicable to almost all of the mobile books. Power supplies, on the other hand, were somewhat peculiar to the type of equipment and consequently were not common, except in two or at most three books. Transmitters and receivers were a little better. In one case, a receiver section would be applicable to eight different books, a transmitter section to four different books.

Charting the books versus sections, we found we had 227 different sections for the 33 standard books, or not quite seven sections per book. This reduced the average down from 14 sections per book — or a 50 percent reduction. Now the work load was getting within reach.

The next consideration was printing. We normally use four different printers. Our usual policy of competitive quotations was out of the question. This, we decided, would have to be handled by a cooperative effort between the four printers. So we did something which we believe to be unprecedented in the graphic arts industry. We called the four printers together for a meeting, explained our problem to them, gave them our ideas, and then asked for suggestions.

COOPERATIVE PRINTING

Here is what was decided. All covers (two-color printing) would be done by one printer. Each printer would get about one-fourth of the 227 sections, to be staggered to prevent overloading. All folding and collating of sections and binding of the books was to be done by one bindery. As each section was printed and sent flat to the bindery, they would immediately fold several copies and send them to us for a check-out. These copies were put into a looseleaf binder, each binder representing one of the books. As soon as the binder was complete, it was forwarded to the bindery to be used as a collating dummy. The bindery then knew the thickness of the book and was able to score the covers, collate, bind, and deliver the completed book. Our books use one-piece covers with the backbone printed. For this project we had to standardize on positioning and printing of the backbone copy since the thickness of each book was unknown until completion.

We use staggered black rectangles as a tab at the right-hand edges of the first page of each section. The title page has open rectangles with the section name printed in each. We had to standardize on tab positioning so that each book would have the same number of tabs and each tab would fall in the right position. Coordinating four printers and a separate bindery was a much more difficult job than we had anticipated — register marks or no.

The writing plan was to assign each writer a specific chassis rather than a complete radio set as is normally done. Sections were submitted separately for copy preparation and forwarded to the printers separately. These were complete sections, i.e., text plus the necessary schematics, parts lists, and illustrations. Overtime for all activities was permitted. Outside sources for typing and drafting were used whenever the schedule was endangered. Outside writers were not used since our staff was considered adequate.

Thus only seven writers, two parts-list writers, and one supervisory editor accomplished the writing phase. Simultaneously, this same group continued to write small "special" manuals every week. During the production of these 40 books, the typing and drafting groups continued to produce the microwave, carrier, military, and "special" two-way books, with some help from outside sources.

CONCLUSION

I would like to conclude by saying that we met every deadline and that every new unit shipped with a brand new manual enclosed. Unfortunately, this was not the case. Engineering changes and last minute shifting of shipping schedules prevented perfection. But in almost every case a book was supplied. In most other cases, installation and operation information accompanied the equipment, and the complete books followed a short time later. The seven large customer "special" books were all shipped on time. The smaller SP manuals and microwave, carrier, and military books were processed on schedule.

A well-received byproduct of this method of producing instruction manuals was the substantial savings in printing costs. Ω

About the Author . . .

EDWARD E. RABIN *is Manager, Engineering Publications Department of Motorola's Communications and Industrial Electronics Division in Chicago. A member of the technical writing profession for the past eight years, he has held positions as technical writer, technical editor, supervisory editor, and managing editor. He is a member of STWE.*

The Anonymous Technical Writer in History

Joel J. Shulman

Throughout history the man who has written the scientific or technical treatise has usually left no trace of his authorship, sometimes by accident, sometimes by his deliberate choice. Some very few persons have achieved everlasting fame as scientists although they performed functions which are presently understood as technical writing or technical communications. But the lot of the vast majority of writers has been anonymity and still is. The avowed objective of these writers was transmittal and communication of technical or scientific ideas, data, hypotheses; compilation of related material; evaluation of results or conjectures —in short, all the functions of technical and scientific communication which presently go under the term of "technical writing." A large number of the outstanding scientific works have unknown authors; some, especially the older works, are listed as the products of writers whose authorship is actually spurious.

Our knowledge of early science is restricted to the written record—without which there would be no documentation of such science — on stone, papyrus, or clay tablets. Only a written record could place scientific achievements in proper relationship with other contemporary accomplishments. This all implied a writer, either the person who performed the scientific feat or a different person who was familiar with the work performed and possessed sufficient knowledge to organize it into an appropriate form.

BABYLONIAN AND EGYPTIAN WRITERS

The early science of Babylonia (or Sumer) appeared on clay tablets and indicated a high degree of sophistication in many scientific fields, e.g., division of the year into 360 days, 360 degrees in a circle, proper methods of fertilizing date plants, and assignment of names and characteristics to the constellations. Because of the severe limitations of space and the work involved in the manufacture and preservation of these tablets the author was obliged to eliminate his name; it took too much space. As a result, we know nothing of the authorship of such work.

On the other hand, the use of papyrus in Egypt encouraged long dissertations. The earliest known papyri are in the fields of medicine and mathematics. Only one, however, the Rhind papyrus, found in a more complete condition than the others, bears the name of a person who was probably either the scribe, who merely transcribed the work of previous authors, or was a knowledgeable person in the field who assembled the accumulated knowledge of the past centuries and established it in a logical order.

In both the Babylonian and Egyptian work the contents are codified and long descriptions are avoided. It is hardly likely that an active practitioner of the sciences would have had the time or the need to write this material, especially in view of the effort which would have been involved. In addition, an important factor in the practice of medicine, astronomy, and many other sciences was the religious function. Consequently such knowledge was kept within a small select group since it would have been a serious crime to permit such knowledge to fall into the hands of the uninitiated, possibly punishable by death. It might also explain the lack of signatures on scientific writings.

As the area of scientific interest expanded, especially in the Greek-Aegean region of antiquity, new developments, such as the founding of educational facilities or academies, produced a need for books or compilations of learning within specialized fields. This collation and systematic organization was necessary for the teachers, who usually accomplished this by means of notes. The students were advised to keep written accounts. Most of the preprinting era scientific collections were produced in this manner.

HIPPOCRATES THE AUTHOR

Much has been written about the works of Hippocrates, the Greek physician of antiquity, who sup-

posedly wrote a great many original medical tracts. Of course, this is all supposition at this date, but the facts which have been uncovered indicate that Hippocrates of Cos was not the author of much of the works credited to him.

When Hippocrates became a famed physician much of the knowledge of his medical group had already been committed to writing. However, it was during the lifetime of Hippocrates that most of it became organized, much of this due to the efforts of Hippocrates and his sons. Certainly, however, the writer was not always Hippocrates, and scholars have found that much work, written centuries later, was attributed to this great physician to make it the more acceptable among those who still rated Greek learning of that age as the most advanced.

It may be said, then, that the writers whose works have been attributed to Hippocrates are virtually unknown. A good guess made at this point in history remains only a good guess. The same circumstances which prevail concerning Hippocrates exist concerning Galen, who lived about 400 years later. Galen, it is believed, was a more prolific writer than his predecessor although he is credited with work he did not do and could not possibly have done.

Unless there is a period of intense scientific activity there is little need for technical writers. Lack of general interest precludes the need for wide dissemination of knowledge. Since the rate of scientific activity was low and the audience small, there was very little technical writing from the end of the golden age in Greece to the Renaissance.

PROFESSIONAL SCRIBES

Whereas the first important source of scientific writing was of the researchers themselves, the second important source of scientific writing came about as a result of the need for professional scribes. Although the important scientists were literate, and were often among the best informed people of their times, the services of a professional writer were required in order to make more than one copy of a document. Some of these writers may have specialized in certain types of writing, or were hired by a closely knit group of researchers, or were employed by a group which wished to keep its collective knowledge secret, yet with a requirement for a written codification to permit complete and correct transmission of data from member to member. Professional scribes in this sense should not be confused with members of religious orders who copied and maintained a good many of the preprinting-age manuscripts which have reached us; these monks and others did not attempt to make public the knowledge that existed in their manuscripts although they often made copies for distribution to other abodes of their members; they were merely copyists.

Other reasons encouraged anonymity of authorship. Many writers found that their expressed views were contrary to the established views of the prevailing religious authorities. During the period of the Renaissance, which corresponded roughly with the period of the Inquisition, such deviations were highly risky. No less a scientist than Leonardo DaVinci wrote in a code, which consisted of writing with his left hand in an exact mirror image of his normal right-handed writing. It was 200 years before it was deciphered. No less a personage than Galileo, serving in his capacity as a university professor, found himself the object of scorn by the religious authorities. That Galileo and others were not necessarily in conflict with the religious views of the ecclesiastical authorities is not important; the ecclesiastical authorities had views concerning lay matters as well, and in the specific case of Galileo it was their views in favor of the word of Aristotle which they wanted to prevail. Even when expressions of the new advanced and frequently heretical scientific thought were less dangerous, many scientific pieces were still being written anonymously. This practice continued almost into the mid-nineteenth century. There was the element of fear in such cases, and this fear was for very real reasons. The expression of unorthodox views, not punishable by established religious authorities, still brought the threat of social ostracism by the community at large or by the most influential members of that community.

ROYAL SOCIETY FOUNDED

In the middle of the seventeenth century in England, this situation was quite prevalent. The new interest in science which led to the founding of the Royal Society of London in 1660 produced new problems in the interchange of knowledge. One of the objectives of the Society was to promote scientific endeavors wherever they were being pursued. This, of course, required correspondence. Therefore a secretary was appointed whose primary functions included correspondence with members in foreign countries and the publication of the *Transactions of the Society*.

One of the first two cosecretaries was Henry Oldenburg, a businessman who had emigrated from Germany to England as a young man and who was educated in the classical languages and also knew the vernacular tongues of northern Europe. Oldenburg served both as the technical editor of the *Transactions* and as translator for correspondents writing in other languages. As editor of the *Transactions* his name did not appear, but his secretarial duties and his own writings indicate the performance of this task.

However, we are certain that much of the correspondence, much of the commentary, and a considerable amount of editorial work has been lost. As mentioned, Oldenburg was of German birth and both knew and

corresponded in German, Dutch, and other languages. As a result of his scientific connections with the continent he received a considerable volume of mail, which placed him in an equivocal position as a potential "security risk" during a period when England was at war with Holland and other countries allied with England's enemies. Oldenburg therefore used the pseudonym "Grubendol." Those who knew, knew that this was the same Oldenburg; but much of the work of Grubendol is lost by name although it exists in fact. Since this was not sufficient subterfuge, Oldenburg was clapped into the Tower of London in June 1667. Samuel Pepys wrote in his diary, ". . . for writing news to a virtuoso in France, with whom he constantly corresponds in philosophical matters; which makes it very unsafe at this time to write, or almost do anything." A short time later Oldenburg was exonerated, probably through the efforts of his very powerful and influential friends who convinced the Crown that the scientific correspondence was harmless to the national security and that Oldenburg was a completely loyal British subject. After this harrowing experience Oldenburg was more discreet in using his name.

Before his unhappy incarceration Oldenburg's correspondence was prodigious; it was considerably reduced, if we are to judge by known works, thereafter. However, such men as Oldenburg would normally have maintained their correspondence, more because of their all-consuming interest in science than from mere obligations to fulfill, despite threat of censure or worse.

GENERAL CONTRIBUTIONS

In addition to the secretarial or technical correspondence and publication responsibilities on the part of the Society's secretary at home, men throughout the world served as regional clearing houses of scientific and curious information. Usually they were scientifically inclined and contributed papers of their own composition, mostly descriptive, concerning their new environments. These men were asked by the Society to contribute whatever they felt would be of interest to the general membership and were also to receive and judge all similar contributions within their respective geographical regions. They were also asked to edit the submissions.

So intense was the opposition to new ideas and to the Royal Society itself that numerous defenses were written, the most famous of which is the one by Thomas Sprat. Sprat's major point was that the scientific discussions were on such a high plane and required so much background that students would not learn of the new ideas and certainly could not perform the necessary experiments. Obviously, therefore, only older men, settled in their ideas, and discreet in their criticism of religion and of the Greek and Roman classics, would be engaged in the new science. Thus, wrote Sprat, there would be no reasonable objections to the new sciences. It is obvious that this defense did not prevent opposition to new ideas, but it was sufficient to demolish the organized attempts at destroying the new scientific societies and their work.

Some letters on scientific subjects, often by eminently qualified scientists, some probably by clergymen educated and interested in science, written to the Royal Society of London, were never signed. That these letters were printed in the *Transactions* is a tribute to the lack of temerity on the part of the editors of the publication. Some very fine scientific pieces suffer from such bastardy.

ANONYMITY FOR FAR-FETCHED IDEAS

Still another reason encouraged anonymity of authorship, this, however, on the part of prominent scientists. A well-known personage with a highly regarded standing in one field might venture into some area with which he was not too familiar. In order to preclude destruction of his already well-earned reputation, the author would publish his ideas anonymously. Among men of integrity, it would have been unthinkable to withhold an idea from consideration by other scientists, regardless of how far-fetched the idea was. During the eighteenth century in England all ideas were given the most serious consideration, since it might happen that one such "wild" notion would permit a single researcher or speculator to establish a new approach. That loss of reputation was genuinely to be feared, it should be noted that many less-than-scrupulous scientists were ready to pounce on any of the greater ones who might slip on even a minor point.

It has been learned that the great chemist and physicist Robert Hooke wrote papers in which he made conjectures on botanical and zoological subjects. The only sure source of this material, properly creditable to Hooke, appears in the *Philosophical Collections,* a series of scientific papers collected, edited, and published by Hooke at his own expense. He also contributed several original papers to the *Collections,* mostly on the natural sciences and mostly unsigned. Hooke published these collections for several years when the Royal Society lacked both funds and personnel for their regular *Transactions.* He may have done it as a means of placing his ideas in these realms, new to him, before the interested public. At the time of publication, early in the 18th century, Hooke was world famous as a chemist, as an "optician" who had collaborated with Newton, and for other important work in the physical sciences.

Confusion is a prime source of anonymous writings. Such confusion as surrounds the work done in the colonies of North America on electricity is seldom dup-

licated in the history of science. Probably the second most important "electrician" in pre-Revolutionary America was Ebenezer Kinnersly. Although Kinnersly was world famous in his day and second to Franklin in his promotion of electrical knowledge, his name has fallen into obscurity. He helped Franklin to perform experiments and wrote about them. Although Franklin claims credit for much of the work on electricity, there is considerable doubt as to whether he did all that he said he did and even greater doubt as to the authorship of some of his papers. Most probably it was Kinnersly, a minister by training and well versed in the presentation of material, who wrote up many of the experiments performed by the group of four men (Franklin, Kinnersly, Thomas Hopkinson, and Philip Syng) who conducted most of the experiments, who helped to devise the language of the science, and participated in the development of a theory of electrical flow. Kinnersly wrote, at Franklin's insistence, a series of lectures on electricity which he delivered, with demonstrations, all through the colonies. These could be considered a form of "training aid" because they were quite complete and resulted in engendering interest in many people in the field of electricity; some of these observers later became almost as adept as the originators themselves, one or two surpassing them in particular areas.

AUTHORSHIP AS LABOR OF LOVE

Despite sound reasons for anonymous publication of scientific ideas, whether from fear of authorities, society, or loss of prestige, the main reason for anonymity of technical writers has primarily to do with the writer himself. Throughout most of history the writer of scientific material engaged in his interest as a labor of love, usually for the edification of a small coterie of friends and other amateurs, seldom for hope of profit, often printing his work at considerable personal expense without expectation of sale of the work.

Inasmuch as such authors were usually known to and in direct correspondence with the other interested parties, there was no need for personal glorification, and likewise seldom was there the need for the author's name to appear as a product of genuine personal interest. The piece was often published without any special consideration accorded an author's signature, either by the author himself or by his publisher. Often a work would become popular enough to offer possibilities of profit for a printer. Although there was no protection by means of copyrights, the author seldom objected. But as a precaution to make sure that the work would be sold and objections would be kept to a minimum, the offending publishers often omitted the author's name whenever possible. In more than one instance, however, the first printing by such an unscrupulous printer bore no author's imprint, while later editions displayed his name prominently; very frequently the name of the author on the book turned out to be more of an inducement to a purchaser than the contents of the volume. Royalties were unknown except by special arrangement.

CONTEMPORARY ANONYMITY

More recent scientific work calls for a far different approach to research and writing than ever before. It has been estimated that as many or more people are presently engaged in scientific and technical or engineering pursuits as in all past history combined. With many scientists and engineers working on a single project the effort of each one is usually too slight to make a vital contribution. The continuity of a project is not dependent upon the comings and goings of its individual participants; as a consequence they become anonymous and their writing counterparts likewise became anonymous.

Concomitant with the growth of scientific endeavor has come a change in educational standards and demands. The old values of oratory, declamation, written communication, and other means of communication of ideas have declined in importance, and as a result, scientists and engineers no longer possess these skills as part of their basic technical equipment. Also, the complexity of the scientific and engineering fields requires more intensive training of potential practitioners in these fields for the work they are expected to perform once the formal stages of training are completed. Hence, the technical writer; not a participant in the scientific activity but a tool—an anonymous tool.

Still another factor that has contributed to making present-day technical writers anonymous is the mass market. Population increase and public interest in science and technology have created a demand for technical material, material on various levels of complexity. This demand, however, must be satisfied in new ways, different from the channels that sufficed previously, as the means of communication of such information have multiplied. These new techniques include society publications (such as the *STWE Review*), the trade press, advertising, the newspaper daily or weekly science column, radio and television, and motion pictures. Many people engage in the business of receiving scientific data from anonymous and not-so-anonymous originators, and converting it into interesting, useful, informative form for general consumption, both for the technically qualified and for the layman. Some of these, such as the newspaper columnists, achieve a high degree of personal recognition. Others,

however, working as members of large organizations, receive little personal recognition or opportunity for personal recognition outside their own organizations.

The trend of 5000 years seems to point to greater and greater anonymity among technical writers, regardless of their particular functions, unless a drastic change will somehow permit the names of writers to appear on documents or productions which are their products. Efforts in this direction, however, would seem doomed to failure; writers seem content to remain in the background while others claim the limelight. Ω

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About the Author . . . .

JOEL J. SHULMAN *is Public Relations Manager for the Pall Corporation, Glen Cove, New York. In this position his duties include writing technical articles, technical sales promotion literature, and press releases, as well as supervising the company's advertising program. Among his previous positions were science writer for the International News Service, advertising agency writer, and technical reports writer. Shulman is presently studying for a PhD at New York University in the field of American civilization.*

Opportunities in Free-Lance and Ghost Writing

Leo G. Sands

The technical writer, who is now in great demand, as evidenced by advertisements in the large metropolitan newspapers, and who is sometimes paid inadequately for his skills, can supplement his income by writing magazine articles. In the course of his work he is exposed to so much information that, if he uses his imagination, will find an almost endless supply of subjects for magazine articles.

There are two ways to earn money as the author of magazine articles. The most obvious way is to function as a free-lance writer, looking to the magazine publishers for income. The other is to become a ghost-writer. Payment for writing and placing articles comes from the firm who employs the ghost.

The technical writer who is interested in hi-fi, ham radio, or home lab work may swap his services for equipment. One of the large makers of communications receivers, for example, will give one of its products to a writer on a memo billing basis, cancelling the billing when he receives tear sheets of the published article. Many hi-fi equipment makers will gladly give samples of their products to writers in exchange for writing services. However, it is becoming increasingly difficult to place hi-fi product stories because of their over-abundance.

Other spare time sources of income for the technical writer include writing of material for correspondence courses and copy for technical sales bulletins, facility brochures, stockholder reports, and technical proposals. Writing is the minor problem. The big problem is to make contacts with prospective clients.

Some writers make a considerable amount of money from free-lance writing alone. Some have quit their jobs and now earn their living from free-lancing. The free-lancer who writes only for technical and trade publications earns his money the hard way. Those who combine free-lance work and ghost writing make out better financially.

Payment for free-lance articles by technical and business publications is not and cannot be high enough for a man to earn a good living unless he is extremely prolific. Payment runs from $25 per article to a top of around $300. The latter figure is generally paid only by consumer publications with large newsstand circulation. In fact, the more technical the article, the smaller the payment is likely to be.

NONTECHNICAL ARTICLES

While the writer of nontechnical articles gets paid more, he has much keener competition and unless he is a name writer, he may find it difficult to get his material published. There are notable successes too. One sports writer in California, for example, gets about $3500 for a typical article, and he turns out about one article per month. Once he got $10,000 for a single article and, in spite of his being a big name, his name did not even appear as author.

One of the most successful free-lance writers faced the choice, at the beginning of his career, of writing for business publications or consumer magazines. Right after finishing college and while headed for California, he saw an unusual occurrence. He saw a train pulling a crane which tore up the tracks behind it. He stopped, took pictures, and got the information for a story. That night he wrote two stories. One was for a railroad trade publication, the other for a consumer magazine. The first was a reporting job. The second was a fiction piece written around the unusual circumstances. The trade book paid him $50, the consumer magazine paid $150. His mind was made up.

For more than 20 years he ground out fiction and made a comfortable living. Recently, as his markets were drying up, he added nonfiction articles to his repertoire. Since he is a ham, he has acquired a knowledge of electronics fundamentals and even delves into light technical subjects.

The technical writer who has a flare for explaining technical phenomenon to the layman can up his earn-

ings. First, he can take a given subject, such as electronic flight simulators, and write a half dozen technical articles about the various facets of the device. For these, he will receive nominal payment. But, he can also write consumer-type "gee whiz" articles for magazines read by the general public and get well paid for his efforts.

As an example of the possibilities, one writer who was handed a project to write about electrical cable for radiant heating applications first wrote a technical piece. In doing his research he obtained considerable information about the inadequacy of electrical wiring in most homes. He wrote a story on that subject which was published in the Sunday magazine of a large metropolitan newspaper. The check, however, was for only $60. Then he rewrote the story and sent it to one of the big home and garden magazines and got a nice $500 check for his trouble.

PUBLISHER MUST BE SOUGHT

Writing the article, however, is only one phase of a project. It is necessary to find a publisher. In fact, it is foolhardy to write an article first and then seek a publisher. The better way is to query editors first, and then write the article to suit a particular publication. Better yet, if the distance is reasonable, one should call on an editor personally to find out what type of article he desires. Some editors furnish specifications on how they want editorial material prepared.

The query should state the subject and the "peg," the slant which should make the article of interest to the readers of a particular publication. Sometimes it is good to enclose a brief outline as well as a sample lead paragraph. If the editor doesn't get excited over its possibilities as a good article, the author is apt to get a rejection slip. The author must be a good salesman as well as a good writer.

There is a difference, however, in style employed in technical manuals and that used in magazine articles. The magazine article should not be stuffy or too formal. If it is written in plain, simple English, it has the best chance of acceptance.

Generally, the author submits a double- or triple-spaced manuscript together with captioned photographs and other illustrations. One very successful author submits his manuscripts in triplicate so that more than one editor can review the article at the same time. However, very few editors have expressed any interest in receiving more than one copy of an article.

The ghost writer first of all has to have a client. If he is employed, he may have to obtain permission from his employer to launch a side line ghosting career. His prospective clients are generally other firms in the same area, although some writers work for clients in other parts of the country.

The ghost may provide his services on a time and expenses basis. Or, he may charge a fixed fee for each project. These fees may run from $500 to over $1000 per article. The client may have already received a request from an editor for an article on a specified subject. In such cases the ghost merely writes the article and the client places it for publication.

In other cases, the client expresses a wish for publicity for his products, services, company, or personnel and leaves it up to the ghost to come up with ideas and arrange for placement of articles. The ghost familiarizes himself with his client's products and operations and then queries editors to determine who is interested in articles about a particular company, its products, or services. He then writes the article to "suit the editor," generally under a client byline, and bills the client as prearranged.

ADDITIONAL TAXES INVOLVED

The spare-time author should consult an accountant or attorney to find out how to avoid getting himself into tax difficulties. All income from spare-time writing must, of course, be reported. However, when one engages in such a business activity, he can deduct those operating expenses which he incurred in earning the extra income. These include a portion of the expenditures for electricity, gas, water, telephone calls, and even house rent. In addition, all expenses incurred for travel, clerical help, photography, etc., are fully deductible. However, professional guidance should be sought on how much and what to deduct.

There are several hundred consumer magazines, more than 2500 business publications, and over 10,000 house organs whose editors have the problem of filling each issue with interesting editorial material. Most of these editors are interested in finding new sources of editorial material. The prospective spare-time or full-time author needs only to establish lines of communications with these editors to find outlets for his planned projects. Ω

About the Author . . .

LEO G. SANDS *is well qualified to write about the field covered in this article. In his position with Sands Associates, Inc., which he organized in 1954, he serves as a marketing consultant to the electronics industry. He ghost writes technical magazine articles for his clients and also writes many articles under his own name. He has half a dozen books and some 500 magazine articles to his credit. He currently headquarters his writing activities in Ridgewood, N. J., and also acts as consulting editor of* Wire and Radio Communications. *He is a senior member of the Institute of Radio Engineers.*

LETTERS

(Continued from Page 2)

the syllabusses for the courses. Members lecture at the technical colleges providing these and other courses.

Membership of the Association, which ranges from Company Directors and Heads of Government Departments to technically qualified students, is divided within the U.K. into local area groups, each of which administers its own affairs, but receives financial aid from the central Executive Council.

The Association is pleased to count Americans among its members, in addition to those from the Commonwealth. Views and Association publications are exchanged throughout the world — East to West — bringing us, we feel, just a little closer together.

We, in this office, were most interested to read the first copy that was received of your *Review* and, because we note that on occasions some of your members visit this country, may we offer a sincere invitation to them to come along and meet us.

The address of the Association is 46 Brook Street, London W1, England, and all communications should be addressed to the General Secretary.

C. A. H. Riches
General Secretary
Technical Publications Association
London, England

To Editor, *STWE Review*:

The writers at one particular company were recently directed to use only standard terms and definitions in their writing. Among those standard terms and definitions were listed various abbreviations. Heaven knows that the publications of this company were badly in need of some standardization; however, the efforts of a group of report writers, applying the standard abbreviations, left something to be desired. The sample which follows stands as a glowing example of the pitfalls of using abbreviations in the writing of technical reports.

Coming quickly to the pt., the wk. accomplished this wk. included determination of wt. and c.g. of the experimental motor as cf. to the original pilot model; cont. effort to reduce the diam. of the nozzle flange bolt circle; cont. wk. toward reduction of max. temp. (in °C) on the nozzle (these efforts were based on calculated math. marg. of safety and incl. indef. data from misc. tests as well as std. wks. on the subj. published recently, viz, J. Applied Sci., 3rd quart. of the yr.).

The pt. is that you must be a sq. if you are not one of those q.v. that a price must be pd. if we suppl. our vocabulary with gro. use of misc. abbreviations ad inf. This is pointed out quite well by the acct. above et seq. discourse which was taken from information found ibid op. cit. even though they were on different pp.

Sounds like something is wrong, doesn't it? Viz, these abbreviations, std. subj. matter though they are, make for a slightly odd engg. pub. which would cause the dept. mgr. to orbit at high rpm, go through a ser. of pl. profane vol. and ruin an engr's fig. with his ft., denting his lc. and lb.ing him most seriously.

We would, therefore, suggest that these abbreviations be deleted this min. (not this mo.) from further consideration in engg. pub. MSS, i.e., before said dept. mgr. writes a memo. to the Personnel Dept. and I wind up ibid I was last year, unemployed.

Daniel E. Wise
Thiokol Chemical Corp.,
Huntsville, Ala.

To Editor, *STWE Review*:

A considerable amount has been written about the qualifications of technical writers, but the authors generally have failed to include, among technical writers, the technical translator. This is curious, indeed, for the technical translator and the technical writer have the same main objective: both endeavor to put ideas into words. They also have some problems in common, such as phraseology, punctuation, and related matters. The technical translator, however, must overcome an additional obstacle, that of another language.

The basic problems of technical translations are known, and hence are reviewed here but very briefly. The technical translator must possess not only a basic understanding of the subject, but he also must be thoroughly familiar with both languages: the foreign language, without which he cannot understand the subject, and English, which is his vehicle for expressing the ideas of the original in a lucid manner.

A number of would-be-translators attempt — or are forced to attempt — translation of subjects with which they are not familiar. They forget that certain words have different technical connotations than they have otherwise, in a nontechnical sense, and that this fact applies to the foreign language just as it does to English.

Consider, for example, the English expression *breeze* which, as applied to coal technology, means fine particles of coke, while its nontechnical meaning is that of a light wind.

A profound understanding of the foreign language is another necessity if the fine shades of meaning are to be rendered correctly in English. This can be especially important in the translation of a business letter, the tone of which might mean the difference between an order being obtained or lost.

The English translation of the original is the most important part of the work because it is the link which enables an English-speaking individual to understand the ideas, expressed in a foreign language, of another individual. It is the final English version which requires the translator to become a technical writer.

In this respect, the translator often has a task more difficult than that of the technical writer since the translator must not only preserve the meaning of the original, but he often will wish to render its flavor and shadings as well. Consequently his freedom tends to be more limited than that of the technical writer.

A translator, like the technical writer, must be an interpreter of ideas. The technical writer, however, has an advantage, no matter how slight, over the translator. He can discuss any matters which are unclear with the author of the report or with the engineer who actually performed the work. The translator, however, can do so very rarely. The author of the article usually is on a different continent, or he may no longer be alive. This means that the translator first must resolve anything which is unclear in the original before he can turn to his task as a technical writer.

Just like the technical writer, the translator must use good judgment in his writing, and he must not allow standard phraseology or word order of the foreign language to creep into his English version. Otherwise, the result might be a sentence such as, "he threw the horse across the fence some hay" or "We greet you with excellent esteem."

In conclusion, it is hoped that the foregoing will have acquainted the reader with some problems faced by technical translators. It should be clear that technical translators and technical writers have many problems and qualities in common and that a good technical translator must also be a good technical writer.

Gerhard P. Schuck-Kolben
Consolidated Coal Company
Library, Pennsylvania

THE TECHNICAL WRITER. J. W. Godfrey and G. Parr. 340 pages. New York: John Wiley & Sons, Inc. (1959). $8.50.

Many of you will remember Alvin Allen's article, "Technical Writing in Great Britain," which appeared in the April 1959 issue of the *Review*. Mr. Allen pointed out that British technical writing is about where American technical writing was 20 years ago. This new book from Great Britain should cut some of this lag.

The title of the book is a little misleading; the subtitle is much more accurate — "An Aid to the Presentation and Production of Technical Literature." In the preface the authors point to the objective of showing the writers ". . . what happens to a manuscript when it leaves their hands. . . . Familiarity with the processes through which a manuscript passes will ensure that the finished product is as efficiently and neatly presented as is economically possible." The book does not deal with the art of technical writing, as many of its American predecessors do, but an appendix with an extensive bibliography on this subject is included.

The authors devote a considerable amount of well-illustrated space to reproduction and illustration processes. There is also a short course in typography, as well as detailed description of the work of a production department.

This book would be a good production reference for experienced writers; it is a must on the reading list of the novice writer. Its only distraction is the Queen's English, which is distinctly different from Americanese but not too bothersome once you get accustomed to it.

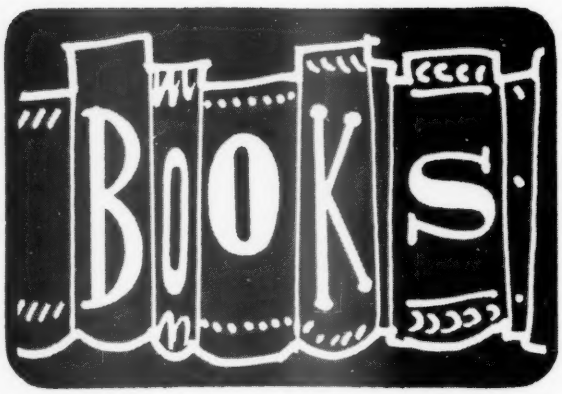
Richard A. Hanousek

RAPID RADIO REPAIR. G. Warren Heath. 224 pages. New York: Gernsback Library (1959).

In *Rapid Radio Repair,* Mr. Heath provides a refreshing change from the norm. He has apparently taken the attitude that as long as he *is* writing a book, he might just as well do a *good* job! His book is just that. . . . . a good writing job.

What makes the book a good one? Well, first of all, it is written with the reader in mind. The reader, in this case, is a serviceman concerned with the repair and maintenance of every type of radio receiver from the currently popular foreign makes to the new transistor portables. The book is laid out with the material in alphabetical order, so that any fault can be located easily and all the possible causes and cures studied.

Mr. Heath has used artwork and photographs to a great extent; the publishers have evidently recognized the merit of Mr. Heath's work and have spared no expense in turning out a fine volume. Mr. Heath has spared no effort either; for example, he has included an invaluable chart of European-to-American vacuum-tube conversions.



While not primarily a theory text, the book is still not a mere catalog of "symptoms versus repairs." Technique in the use of test equipment and parts replacement is discussed, but other texts or previous knowledge must be consulted for more detailed theory.

To tackle the book in the same manner that a serviceman would, we drew up several radio failures, considering just about all types of radio equipment. Using only the book as a reference, we quickly located *all* of the examples and found complete information as to the possible how's and why's, and the cures as well.

I have one objection to the book. This review was written after study of the soft-cover version. I would heartily recommend that if you contemplate the use of this book as a reference work, you obtain the hard-cover. The backbone on my copy is starting to come apart.

In summary, Mr. Heath and the Gernback Library have produced an excellent volume for the serviceman who has some knowledge of electronic theory. Not a book for the raw novice, nor for the professional engineer, this volume will nonetheless serve the hobbyist or the television technician who is occasionally called on to service a radio.

Byron G. Wells

BASICS OF DIGITAL COMPUTERS. John Murphy. 416 pages. New York: John F. Rider, Publishers, Inc. (1959).

This "picture book" presents a very complete fundamental approach to the subject, but in some respects is too broad in coverage. The text material often does not provide a complete understanding of the topic being presented in picture form. This is pointed up by the fact that over half of the page material is in illustrations.

The use of this volume for a digital computer familiarization course is good but does not meet the objectives claimed by the author. The material is logically presented and accurate within the limits of such a

rapidly progressing field. It is not a design book, but will provide technical people with a "talking" knowledge of the subject.

In a course for technicians, I used the volume as a text and found it satisfactory when supplemented with informative lectures. The inclusion of transistorized digital circuits would improve the usefulness of the book considering present computer technology.

R. D. Demo

SCIENTIFIC RUSSIAN. A Concise Description of the Structural Elements of Scientific and Technical Russian. George E. Condoyannis. 225 pages. New York: John Wiley & Sons, Inc. (1959).

This book is an excellent and very welcome addition to the still small number of books in the field.

Professor Condoyannis never losses sight of the aim of his book, which is to enable the scientist or engineer "to acquire rapidly and directly a reading knowledge of Russian adequate to cope with technical articles and books in his field." The grammar is consistently presented from the Russian-to-English point of view. For example, the verbs are introduced not in the traditional manner, viz., "How can certain verb forms be obtained from a given infinitive?" but in the only manner that is of value to an American scientist wanting to acquire a translating knowledge of Russian, viz., "How can a verb form be recognized for what it is and how can it be traced to the verb form listed in the dictionary?" The same Russian-to-English point of view characterizes the treatment of the noun-adjective system, the pronouns and the prepositions, and spelling and pronunciation.

Another advantage of this book flows from Professor Condoyannis' realization from years of classroom experience "that a reading-aim textbook must cope more seriously than the ordinary beginner's book with the problem of what to take up first, since almost any construction may occur in the very first sentence of the first technical article the student tries to read." The admirable solution has been "to start with a bird's eye view of the structure of the Russian language." This particular chapter is actually Chapter II, following the introductory chapter on spelling and pronunciation. In both chapters many cognates and otherwise easily recognizable words are given as devices to teach reading fluency and recognition of word categories. Thus, when the student starts the detailed study of grammar in Chapter III he has already acquired (1) a sizable vocabulary, (2) a general idea of the difficulties he will now encounter, (3) some ability to recognize word derivations. In addition, Chapter II has an excellent note on "the use of the dictionary." This helpful and necessary aid is repeatedly reinforced in subsequent lessons.

The later chapters fulfill the promise made in the Foreword; they "serve mainly to fill in the details of the over-all pattern," and they do it briefly and clearly. This reviewer found the treatment of the following points outstanding, again from the reading knowledge point of view: the participles (how to recognize them, how to trace them to the infinitive, how to avoid confusing them with other word categories); the imperative; the reflexive verbs; word building; and a section on "troublesome words" — a section that one would wish to see expanded in possible future editions. The book ends with and culminates in a Master Verb Table for which students will be very grateful indeed.

The only points with which I felt dissatisfied are (1) the term "momentary" in denoting the verb forms, of the type "is going," which could be misleading and, at any rate, is not as clear as the conventional one "Progressive" (2) the sequence of cases NAPDI instead of NGDAIP.

John Kempers

THE ELEMENTS OF STYLE. William Strunk, Jr. (Revisions by E. B. White). 71 pages. New York: Macmillan Company (1959).

Perhaps the only book on style ever to make the best seller list of the New York Times, this volume of 71 pages is a gem. Originally written by Professor William Strunk, Jr., in 1918, it has been revised by his pupil E. B. White. The book and its rules were written for all writers, and it belongs in the library of all technical writers both as an excellent style book and as an example of solid precise writing. For as Professor Strunk says: "Vigorous writing is concise. A sentence should contain no unnessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires not that the writer make all his sentences short, or that he avoid all detail and treat his subjects only in outline, but that every word tell."

This little book has only eight rules of usage, ten principles of composition, a discussion of form, a list of words commonly misspelled, and a list of words and expressions commonly misused. The advice given in the book is clear and sharp. On the use of advertising language there is this: "Today the language of advertising enjoys an enormous circulation . . . Your new kitchen range is so revolutionary it obsoletes all other ranges. Your counter top is beautiful because it is accessorized with gold-plated faucets. Your cigarette tastes good like a cigarette should. And like the man says, you will want to try one. You will also, in all probability, want to try writing that way, using that language. You do so at your peril, for it is the language of mutilation."

Allan Lytel

MARINE ELECTRONICS HANDBOOK. Leo G. Sands. 228 pages plus index. Indianapolis: Howard W. Sams & Company (1959). $3.95.

GUIDE TO MOBILE RADIO. Leo G. Sands. 160 pages. New York: Gernsback (1959). $2.85.

Leo Sands, an STWE member, has written two excellent books. They complement each other and, to a limited extent, they overlap. This is a combined book review.

Why two-way radio? This is a fast-growing segment of technology which has been, until now, neglected by writers. Two-way radio has come a long way. And the last book on commercial two-way radio, as well as the only other one I know of, was Milton Sleeper's *Mobile Radio Handbook,* which was written eight years ago.

In eight years two-way radio has expanded. According to the FCC report for 1958, radio permits and licenses grew by almost 200,000. At year's end there were more than 2,100,000 authorizations and over 1,500,000 transmitters in actual use. This is almost 250,000 more transmitters than were in use at the end of 1957.

Safety and Special Services Radio alone, with its more than 40 groups, includes 465,000 authorizations with more than 1,400,000 mobile and fixed transmitters. Public groups such as police, fire, and the like operate almost 300,000 of these, and private industry operates some 420,000.

Marine Electronics covers marine two-way radio (ship-to-ship and ship-to-shore), sound systems, direction-finders, depth sounders, steering devices, marine radar, power sources, and rules and courtesy. Both the complex index and the fold-out schematics add to the value of the book.

In *Mobile Radio* the author explains the land-based two-way radios found in cars, trucks, and on trains. The book also gives a sound and accurate, if not detailed, picture of all aspects of both mobile and base stations. The book has no index, which reduces its value.

Both books are well written with helpful illustrations. *Marine Electronics* has the usual well-organized illustrations found in other Sands books.

Leo Sands writes with the authority of knowledge. He has also written several magazine articles based upon the books. More technical writers should write as he does on their own specialties.

Both books assume that the reader has a firm, solid understanding of a-m and f-m receivers and transmitters and basic electronics. Both are primarily for technicians. But I wish that I had written them.

Allan Lytel

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(Continued from Page 3)

If technical writers write about technology, how do they do it? In Sanskrit? Of course not. They use Anglo-Saxon *words* to "convey information accurately and efficiently."

This being the case, have we not—as technical writers—as much right to lay claim to the contents of the dictionary and similar repositories of words as the poet or historian, the novelist or journalist, the fiction or science writer—yes, even the college professor of English? If this is a reasonable position to take, then how is it possible to have a body of knowledge that has a content of its own for each and every profession? Certainly words are an essential part of every discipline regardless of profession. How then can "a content of its own" be complete without words?

SYNTHESIS OF WRITING

But let's move on. To use Anglo-Saxon words "to convey information accurately and efficiently" we must arrange them in some order. When arranged in proper order, that structure is called a sentence. Do we not as technical writers use words structured into sentences to convey meaning? Of course we do.

Carry the grouping process through the next two logical steps: (1) grouping sentences related in thought into paragraphs and (2) grouping paragraphs related in subject matter into completed reports and papers, or bulletins and manuals, or articles and science stories. It then appears that as technical writers we may lay claim to the vast collection of works on grammar and rhetoric.

Consider one more illustration. Among us are technical writers whose major in college was engineering, whose minor was English and literature. Would it have been possible for these persons to have prepared themselves for their future in technical communications had it not been possible to borrow from the body of knowledge directly related to engineering and to English and literature? The answer is obvious.

The basic elements of the body of knowledge directly related to technical communication are at hand. If one is weak in the fields of science and engineering, there are courses open to him in nearby colleges and universities and there are books galore on the subject in libraries. If, on the other hand, one is weak in the field of exposition, again there are courses open to him and books on the subject on the library shelves. There is no need to feel that we are in a profession born out of wedlock even if we do not have a body of knowledge directly related to technical communications, the content of which is not borrowed from other disciplines. What profession does have such a body of knowledge? Engineering? Law? Medicine? This is doubtful.

Let's look at this same question in a slightly different way. Most professions now have a hard core of information that they logically can lay claim to. But did they always have this, or is it something built up over a long period of years? At what point in this progression did, say, engineering, become a profession?

Many thought-provoking ideas can come from a discussion of such questions. For example, possibly a closer examination of the body of knowledge possessed by each of the professions would reveal just how much of this knowledge really was produced or originated by that profession.

LEGAL PARALLEL

A final point that can lead to further interesting discussion relates more directly to our jobs. In a very true sense, we are interpreters. Our job is to analyze technical information and interpret it. Is there not a close parallel in the legal profession?

Also, the interpretations of the legal profession become precedents or standards for other members of the profession to follow. Do we not follow a similar course? Do we not base our interpretations, our writing, on our own precedents and standards to a large degree? Certainly we borrow from the field of English and literature for grammar, structure, and so on—as does every profession—but from whom can we get the knowledge of how to interpret a guided missile control to an operator? Perhaps, then, techniques of interpretation are part of our body of knowledge.

Obviously, all the aspects of the "body of knowledge" question cannot be explored here, but perhaps these and similar questions can lead us to a more realistic picture of our own profession in relation to others.

Actually, it is fortunate that to have a body of knowledge for any profession there must be some borrowing from other disciplines. How else would cross-fertilization of ideas occur? How else would members of one profession have an appreciation for members of the other professions? And, how else would members of these professions talk to each other over the verbal fence that has become the hallmark of each profession? This much is certain: We all benefit from the fact that we can roam at will through the disciplines without fear of trespass from some curator of a body of knowledge.

EDUCATIONAL QUALIFICATIONS

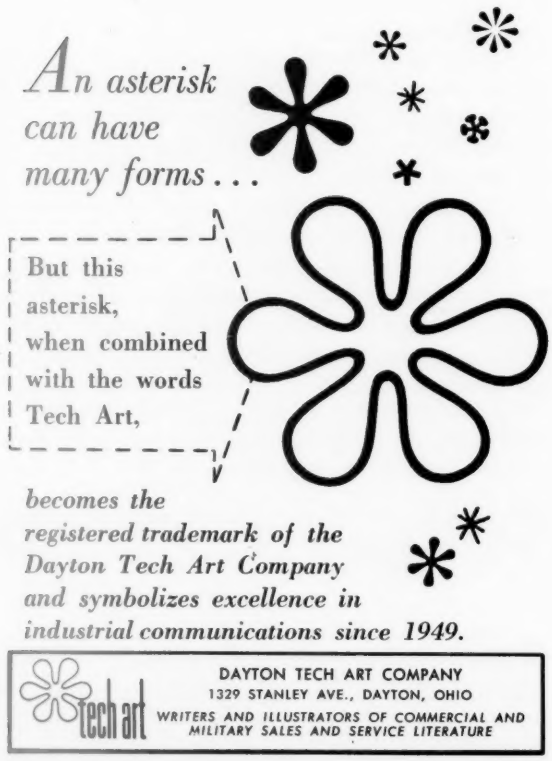
Consider now another aspect of study and training—the educational qualifications for technical writers. Before a meaningful inventory can be made of the

educational qualifications for a technical writer, a number of things must be known about the particular writing job.

For the moment, let's think of it in terms of your job. Do you know all the things you are supposed to do? Do you and your boss agree on what you are supposed to do? Do you know the quantitative targets? The qualitative targets? How would you describe your job if you were asked to do so by your boss? How much authority do you have? What are your organizational responsibilities? What are your personal responsibilities? What are your relationships within the company? What are your relationships outside the company? Other questions can be asked, but this list suggests the kind of questions you must ask yourself—and then answer—before a personal education inventory is meaningful.

Once such an inventory has been taken and you know the areas of weakness in your knowledge of your job, or in your skills in the application of this knowledge, you can take steps to correct that weakness. Take a long and serious look at your job; then take an equally long and serious look at yourself in the mirror of self-appraisal. Are you happy with what you see?

Charles W. Ferguson's *Say It With Words*—a fascinating book—had this to say about technical writers: "Manuals describing the new jet transports, pilots tell me, are so abominably written as to be incomprehensible." Mirror, mirror on the wall . . .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THE SUCCESS INGREDIENT

Let's move next to the second essential element in the definition of profession: success. The success or failure of any profession—regardless of its nature—is determined by the adequacy with which its members serve the needs of the people. The true measure of a professional man's success is the quality of the service rendered, not the financial gains amassed; for quality of service rendered determines monetary gain.

Note if you will the interdependence of this essential element upon that of "study and training" and upon that of "conduct." These are apparent relationships. But what about the not-so-apparent relationships? What about leadership? Initiative? Judgment? Motivation? Resourcefulness? Mental alertness? Analytical ability? Self-reliance? Vision? Character? Aren't these the personality traits associated with success? And aren't these the personality traits that in a large measure determine how well a person can serve the needs of the people?

Closely related to personality traits are certain leadership abilities. Such abilities as planning, organizing, developing people, delegating responsibilities, working with others, communicating, and maintaining morale. Aren't these the abilities that tell how a person works? And doesn't how a person works determine how well he can serve the needs of the people?

Then, too, there are matters of a more personal nature. Do you find your work a challenge? Are you continually trying to make yourself worth more to your employer than he pays you? Do you find you are earning the prestige and professional recognition you feel your position warrants? In this connection never lose sight of the fact that prestige is something that must be won. It is something that cannot be bought, nor is it something that comes automatically because of position; it is something one can deserve, but never demand. To put it another way: It is the *person* who earns prestige—his job doesn't do it for him. You can only achieve professional recognition to the extent that you accept your responsibility to yourself, to your employer, and to the people you serve. Therefore, if you would succeed in your chosen field of endeavor, be guided by these dictums.

PROFESSIONAL CONDUCT

Let's move on to the third and final essential element in the definition of profession: conduct. Your relations with your employer, with your fellow employee, and with the public you serve more often than not determine your professional status. Conduct is something that is very personal, something that is influenced greatly by your moral outlook and religious belief, something that is dependent upon self-discipline and self-determination, something that earns the confidence of ac-

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quaintances and trust of friends. Tolerance, judgment, diplomacy, patience, and cooperation all must be brought to bear if you want to develop a set of attitudes that characterize and distinguish a profession.

These are things you yourself should do. In addition, there are things that you should do collectively. For example, you should join a professional society if you are not already a member. And in your case, that society should be STWE.

This membership brings with it obligations and responsibilities. The obligations are to support the aims and purposes of the Society. The rewards of such support are many, but perhaps the greatest is the more professional outlook you develop toward your work. The responsibilities are to respect the Society's code of ethics in your personal conduct. Since it is a common practice for professional societies to develop and adopt principles, ideals, and regulations to guide members in their conduct, you should abide by such codes of ethics and endeavor to promote the highest possible standard of professional character. Only through such attitudes toward your work can you make a worthwhile contribution to your profession.

Remember that a profession arises from the attitudes the members of that profession have toward their work. These attitudes are formulated into moral responsibilities and ethical considerations, for unless we recognize ethical standards and ideals among ourselves, we cannot expect outsiders to define them for us. And where do ideals of a profession come from? From the profession itself and from the preparatory period of study and learning before entering the profession.

A philosophy of ethical standards and moral responsibilities must come before we can rightly claim professionalism. And such a philosophy can only be acquired through introspective study when the ideals and ethics that come from this introspection are shared. A belief in yourself and a belief in the value of your work must come before a philosophy can be developed. Philosophical concepts and beliefs are intangibles that cannot be acquired through studying mere subject fields. Only through clear delineation of our moral obligations to the society we work in and more adequate establishment of ethics on which to judge ourselves can we hope to acquire these philosophical concepts.

OPPORTUNITIES FOR YOU

If you as a member of the young and growing profession of technical communications are at all interested in guiding the destinies of the Society through adolescence to adulthood, opportunities galore are open to you.

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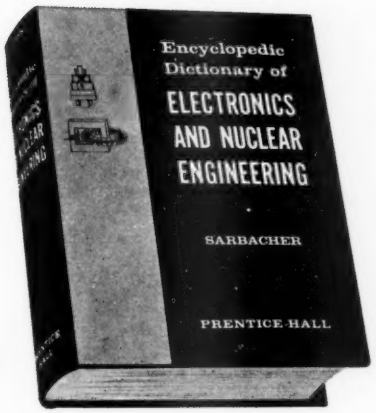

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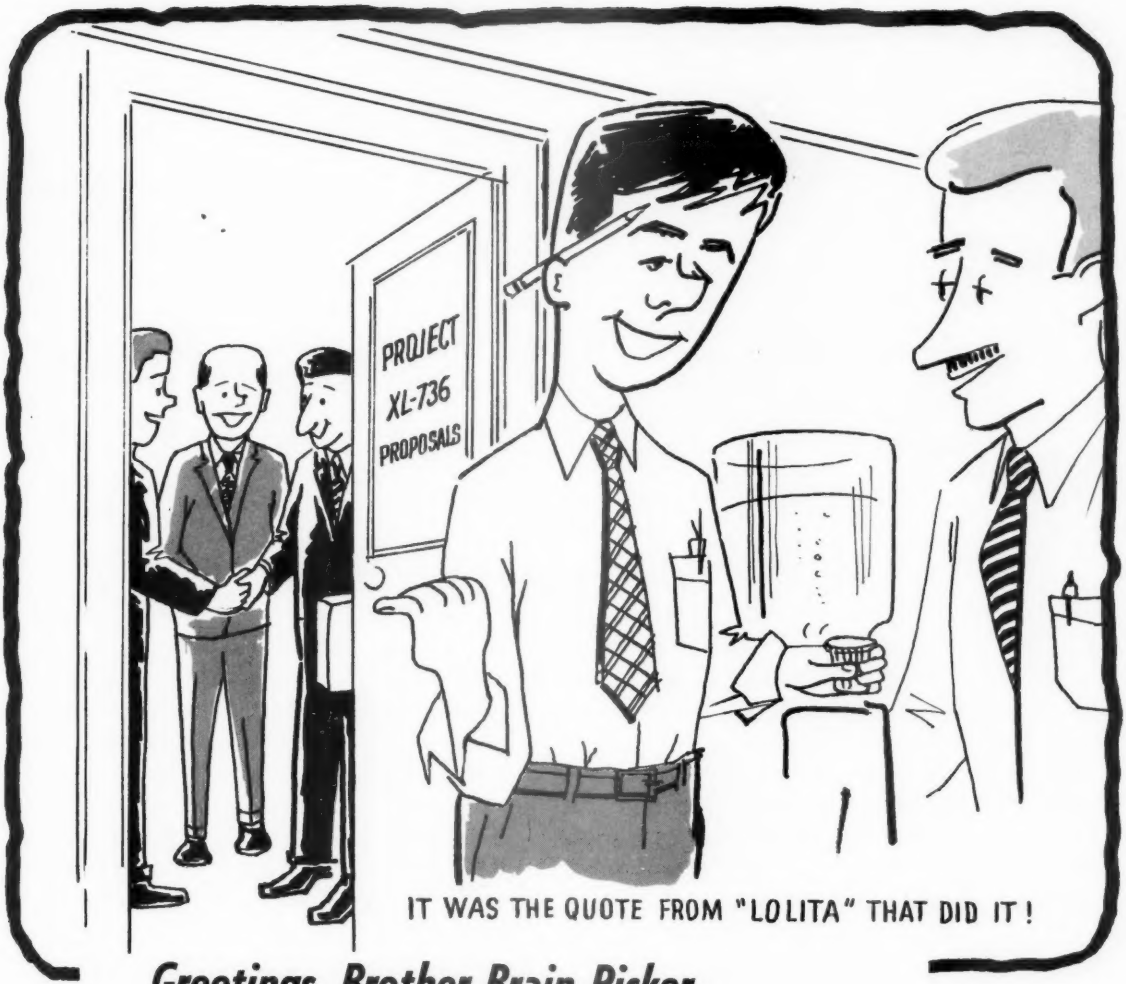

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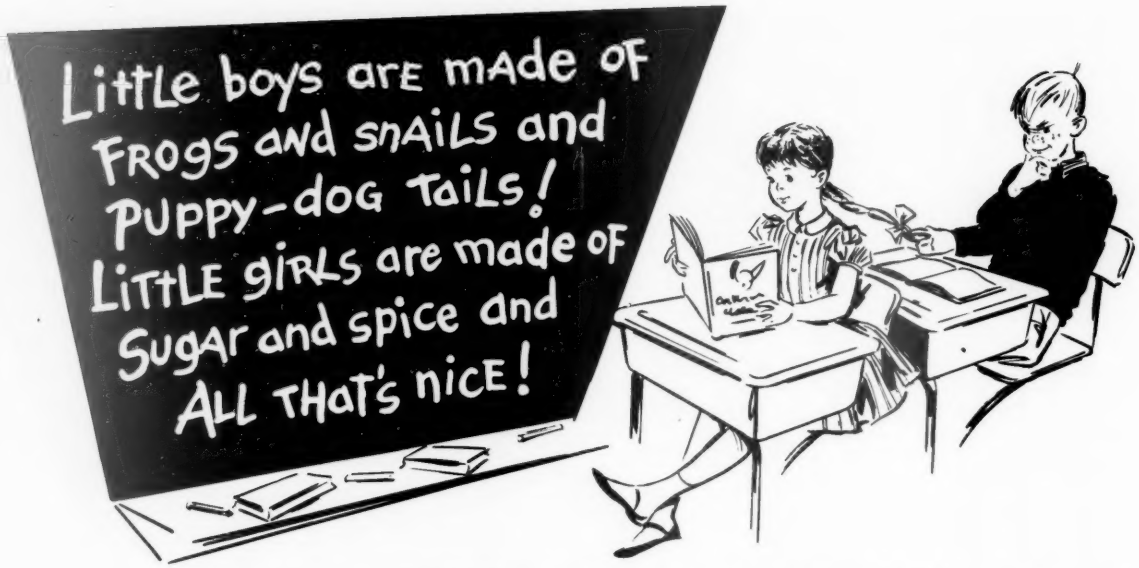

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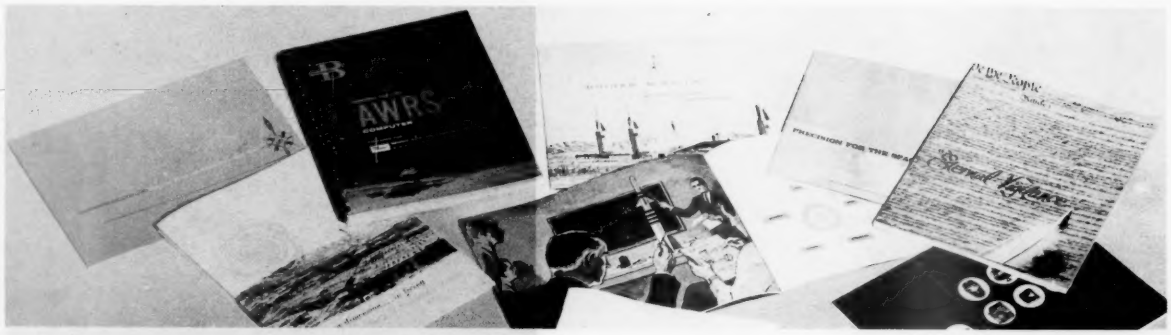

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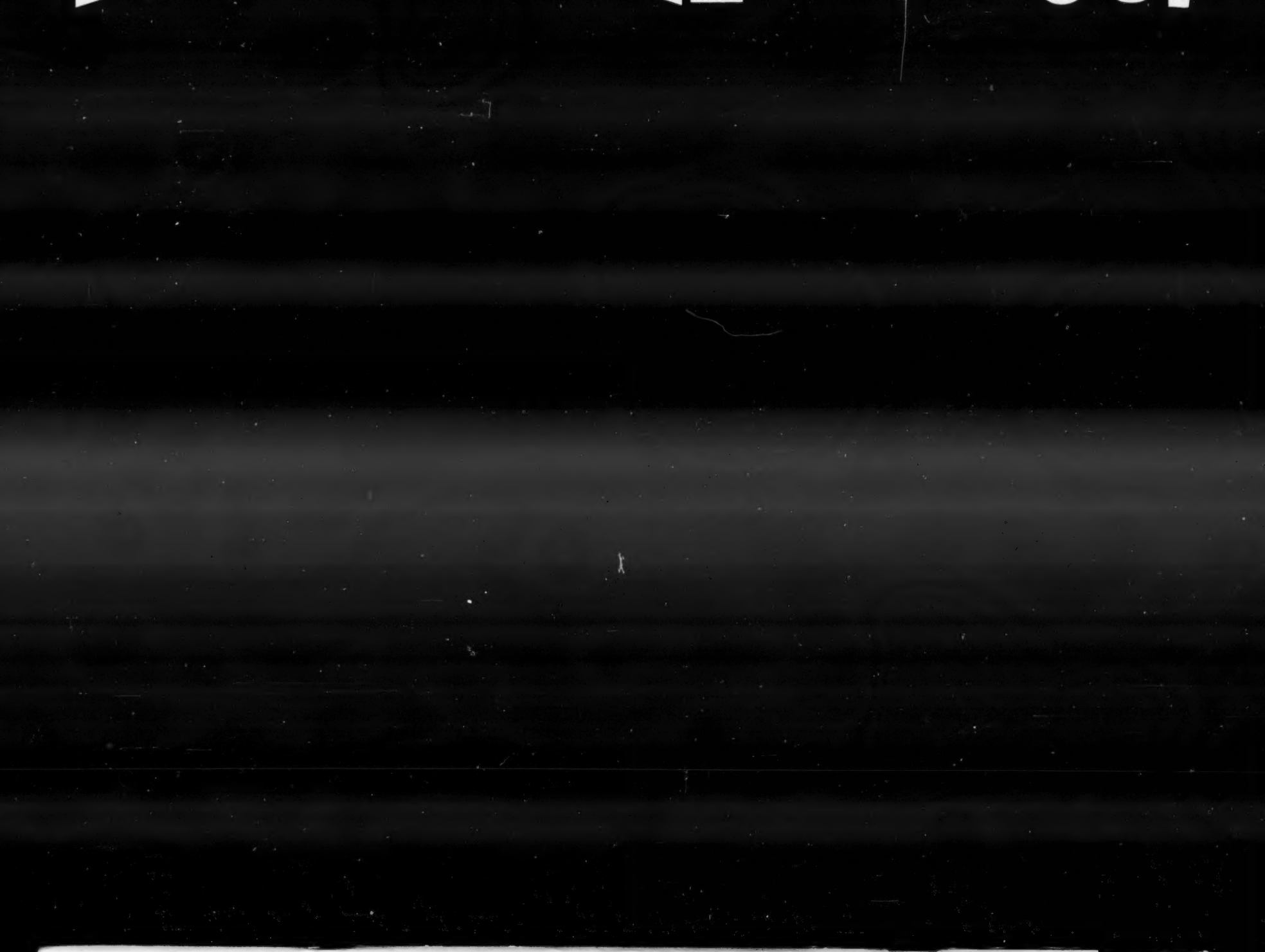
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